Check Out Roxio's VideoWave 5 p.22

We Review Corel WordPerfect Office p.22

smartcomputing.com

Smart Computing®

In Plain English

July 2003 Vol. 14 Iss. 7 $4.95 U.S. $6.50 Canada

We Pick The Best Genealogy Program p.18

Your Next Computer: Build Or Buy? p.34

Windows 2000: The Primer p.30

Quick How-To's

Avoid Paper Jams / Use Win98's Find Feature

Software Tips

Create Charts / Use Paste Special In Excel

Shoot, Edit & Print

Perfect Pictures

- Learn More About Digital Video Cameras
- Adjust & Enhance Digital Images
- Scan & Archive Heirloom Photos
- Improve Your Photo Printouts

How-To

Shop For An LCD p.41

Copy Your LPs Or Tapes To CD p.75

Online

Buying A Car Online? Read This First p.44

Lileks.com: The Best Web Site You've Never Heard Of p.46

Technology

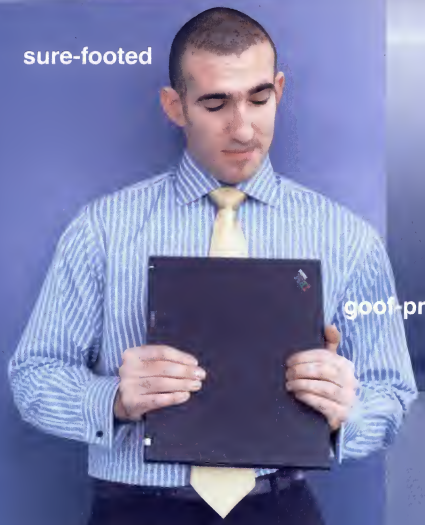
Alternative Data Storage Options p.38

MP3 Players: What Do They Offer? p.92

0 74470 77294 1 07>

On The WEB

- Avoid DLL Problems
- Use Lines & Shapes In PageMaker



At the touch of a button, users can now save lost data. Not to mention time and sleep.

Everyone makes mistakes, but not everyone can undo them. Now, thanks to Rapid Restore™ PC software preloaded on ThinkPad® notebooks, you can do just that. Simply press F11 and you're able to launch a recovery program which rescues previously saved versions of lost data, applications and operating systems. You're back on track in no time. And to boost confidence further, there's the outstanding mobile performance of new Intel® Centrino™ mobile technology (on select models). It's a foolproof way to do your best work. And put your best foot forward.

intel inside
centrino
MOBILE TECHNOLOGY

IBM ThinkPad X31

think confidence

Best blend of ThinkPad portability and essential features

IBM ThinkPad R40e

Distinctive Features:

- Access IBM — Easy access to online and on-system information
- IBM Rapid Restore PC — Managed data-recovery solution

System Specifications:

- Intel® Mobile Celeron® processor 1.70GHz
- 13.3" XGA TFT display
- Integrated video graphics
- 128MB DDR SDRAM std/1GB Max
- 20GB hard drive
- CD-ROM
- Microsoft® Windows® XP Professional
- 2.5-hr Li-Ion battery
- 10.0-lb travel weight
- 1-yr system/battery limited warranty*

$949* NavCode™ 26R4210US21

With Microsoft® Office XP Small Business	$1,078
ServicePac® Service Upgrade 3-yr onsite/9x5/ Next Business Day Response* (#30L9195)	$243

Perfect balance of performance and portability

IBM ThinkPad T40

Distinctive Features:

- Hard Disk Drive Shock Absorber — Offers protection for the hard drive
- IBM Embedded Security Subsystem 2.0 (requires download of security software from IBM)

System Specifications:

- Intel® Centrino™ mobile technology
  - Intel® Pentium® M Processor 1.30GHz supports Enhanced Intel SpeedStep® technology
  - Intel® PRO Wireless Network Connection 802.11b
- 14.1" XGA TFT display
- 32MB ATI Mobility Radeon 7500 4XAGP graphics
- 256MB DDR SDRAM std/2GB max
- 30GB hard drive
- UltraBay Slim CD-RW/DVD-ROM combo
- Microsoft® Windows® XP Professional
- 5.0-hr Li-Ion battery
- 4.5-lb travel weight
- 1-yr system/1-yr battery limited warranty*

$2,179 NavCode™ 237319U M521

With Microsoft® Office XP Small Business	$2,308
ServicePac® Service Upgrade 5-yr onsite/9x5/ Next Business Day Response* (#69P9200)	$449

Powerful and competitively priced desktop replacement

IBM ThinkPad G40

Distinctive Features:

- 4 USB 2.0 ports for added connectivity
- Inclined keyboard for ergonomic extended use

System Specifications:

- Intel® Pentium® 4 processor 2.40GHz
- 14.1" XGA TFT display
- 32MB Integrated Intel® Extreme Graphics
- 256MB DDR SDRAM std/1GB max
- 20GB hard drive
- DVD-ROM
- Microsoft® Windows® XP Professional
- 2.0-hr Li-Ion battery
- 7.0-lb travel weight
- 1-yr system/battery limited warranty*

$1,349 NavCode™ 23882MU M521

With Microsoft® Office XP Small Business	$1,478
ServicePac® Service Upgrade 4-yr onsite/9x5/ Next Business Day Response* (#69P9194)	$399

Extreme mobility in a small and light ultraportable

IBM ThinkPad X31

Distinctive Features:

- ContourFlex™, FireWire and 2 USB 2.0 ports for easy connections to peripherals
- IBM Embedded Security Subsystem 2.0

System Specifications:

- Intel® Centrino™ mobile technology
  - Intel® Pentium® M Processor 1.40GHz supports Enhanced Intel SpeedStep® technology
  - Intel® PRO Wireless Network Connection 802.11b
- 12.1" XGA TFT display
- 16MB ATI Mobility Radeon 7000 4XAGP graphics
- 256MB DDR SDRAM std/1GB max
- 40GB hard drive
- Microsoft® Windows® XP Professional
- 5.5-hr Li-Ion battery
- 3.6-lb travel weight
- 3-yr system/1-yr battery limited warranty

$2,229 NavCode™ 26722CBU-M521

With Microsoft® Office XP Small Business	$2,358
ServicePac® Service Upgrade 4-yr onsite/9x5/ Next Business Day Response* (#69P9198)	$299

IBM ThinkPad Upgrades

256MB CL2.5 DDR SDRAM SODIMM Memory	(#10K0030)	$54

IBM Wireless Networking Options

IBM High Rate Wireless-LAN Mini-PCI adapter	(#22P7701)	$109
Cisco® Aironet® 802.11b Mini-PCI (wireless upgradable models only)	(#31P8301)	$108
Linksys Wireless Dual Band Router (wireless upgradable models only)	(#22P7131)	$220

ThinkPad Notebook Accessories

Belkin Travel Surge Protector and retractable phone cord	(#22P7127)	$20
GemPlus GemPC400 Smart Card Reader from IBM	(#31P6901)	$75
Targus DEFCON PC Card Fingerprint Reader	(#31P6763)	$175
ThinkPad Port Replicator II	(#74P6733)	$179
Lexmark X5150 All-in-One	(#22P7149)	$180
IBM Portable USB 2.0 Hard Drive with Rapid Restore	(#09N4211)	$289

Upgrade your system with Microsoft® Office XP Small Business to Microsoft® Office XP Professional with Publisher.

1 866 426-1810 | ibm.com/shop/m521
Save on shipping, order online.[11]

IBM recommends Microsoft® Windows® XP Professional for business.

Warranty Information: For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept. JUAA/B2G1. IBM makes no representations or warranties regarding third-party products or services. *Prices are not includible for on-shipping and are subject to change without notice. Reseller prices may vary. †GB = 1,000,000,000 bytes when referring to storage capacity. Accessible capacity is less; up to 3GB is used in service partition. Requires Internet access account; may not be available in all areas. Service software may differ from its retail version (if available) and may not include user manuals or all program functionality. Software license agreements may apply. These model numbers achieved eTesting Labs, Inc.'s BatteryMark™ 4.0.1 or the ZD Davis Media, Inc.'s Business Winstone 2002 BatteryMark™ Version 1.0. Battery Rundown Time is at least the time shown. Times may vary depending on configuration, power management, battery condition, applications used and other factors. Battery life and recharge times will vary based on many factors including screen brightness, applications features, power management, battery condition and other customer preferences. Includes battery and optional travel bezel instead of standard optical drive or UltraBay bay. Approximate weight may vary due to vendor components' manufacturing processes and options. Percentage may vary by vendor points on the system. Telephone support may be subject to additional charges. For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician. Certain Microsoft® software product(s) included with this computer may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product upload on procedures and Microsoft's privacy policy will be detailed during initial launch of the product. If upon certain reinstallations of the software (probably or reconfigurations of the computer) and may be completed by Internet or telephone (toll charges may apply). These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5/4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For committed service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 9x5/4-hour service is not available in all locations. External peripherals, such as radio, tape drives and channel controllers, require their own separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebook warranty upgrades, LCD or other component replacement, IBM may choose to perform service at the depot repair center. For faster, non-IBM-competitive, customer-must-provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts, such as batteries, frames and covers. With Intel SpeedStep, processor speed may be reduced to conserve battery power. †Based on IEEE 802.11b. The wireless LAN product has been designed to permit legal operation worldwide in regions in which it is approved. ††Operates only between 12-14 in use permitted in all regulatory regions of the world. Consequently, the wireless LAN feature is limited to operate on channels 1-11 and will not support channels 12, 13 and 14. This product has been tested and certified to be interoperable by the Wireless Ethernet LAN Compatibility Alliance and is authorized to carry the Wi-Fi logo. Standard shipping excluded when you order online. U.S. only. Power management features reduce processor speed when in battery mode. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation. IBM Company, Intel, Intel Inside, Intel Inside logo, Celeron, Centrino and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names are trademarks or service marks of others. © 2003 IBM Corp. All rights reserved.

The IBM NetVista desktop with self-help IT assistance helps make the most of your greatest asset. Your IQ.

Now when your users have an IT problem, they don't always need to consult the IT helpdesk. Because the NetVista™ desktop with Access IBM can help answer common computer questions they might have. Everything from how to set up the machine to where to find links to online support (requires Internet access; not included). It's technology designed to help them stay as independent as possible. And the Intel® Pentium® 4 processor (on select models) provides exceptional performance across the board. So let Access IBM do its part for you. While you focus on coming up with your next big idea.

intel inside pentium 4

IBM NetVista A30

think productivity

Innovative technology and competitive prices

IBM NetVista A30

Distinctive Features:

- IBM Rapid Restore PC — Unique managed data-recovery solution

System Specifications:

- Intel® Pentium® 4 processor 2.40GHz
- 128MB DDR SDRAM
- 40GB hard drive
- CD-ROM
- Integrated 10/100 Ethernet
- Microsoft® Windows® XP Professional
- 1-yr parts and onsite labor limited warranty[1]

$669* NavCode™ 8315A2U-MS21

With Microsoft® Office XP Small Business[2] $798

ServicePac® Service Upgrade[3]
3-yr onsite/9x5/
4-hr Response (#54P1862) $239

Stability and manageability for your business

NEW! IBM NetVista M42

Distinctive Features:

- IBM Embedded Security Subsystem 2.0
- Access IBM — Automated solution to help resolve common computer problems

System Specifications:

- Intel® Pentium® 4 processor 2.40GHz
- 256MB DDR SDRAM
- 40GB hard drive
- CD-ROM
- Integrated 10/100 Ethernet
- Intel® Extreme Graphics
- Microsoft® Windows® XP Professional
- 3-yr parts and onsite labor limited warranty[1]

$979 NavCode™ 830544U MS21

With Microsoft® Office XP Small Business[2] $1,108

ServicePac® Service Upgrade
4-yr onsite/9x5/
Next Business Day Response (#69P9161) $89

Smallest NetVista desktop without compromise

IBM NetVista S42

Distinctive Features:

- Uses up to 64% less space than traditional IBM desktop chassis
- Full-size desktop options and 7 full-height PCI slots

System Specifications:

- Intel® Pentium® 4 processor 2.40GHz
- 256MB DDR SDRAM
- 40GB hard drive
- CD-ROM
- Integrated 10/100 Ethernet
- Microsoft® Windows® XP Professional
- 3-yr parts and onsite labor limited warranty[1]

$959 NavCode™ 8319A1U MS21

With Microsoft® Office XP Small Business $1,088

ServicePac® Service Upgrade
4-yr onsite/9x5/
4-hr Response (#69P9162) $250

Value server for small business

IBM @server xSeries™ 205VL

Distinctive Features:

- Diagnostic LEDs: Automatic Server Restart™ and Predictive Failure Analysis® help to improve uptime
- IBM Director 4.1 Software — IBM Director 3.1 recipient of PC Magazine's Editor's Choice on October 1, 2002

System Specifications:

- Intel® Celeron® processor @ 1.80GHz with 400MHz Front Side Bus
- 128MB PC2100 CL2.5 ECC DDR SDRAM memory std/ 8GB max
- 40GB ATA-100 EIDE 7200rpm hard drive std/ 240GB max
- 5 available slots/4 available bays
- Integrated Gigabit Ethernet
- Available IBM Remote Supervisor Adapter
- Toolless tower chassis with optional 4U rack mounting
- 1-yr parts and onsite labor limited warranty[1]

$499 NavCode™ 8486M4X-MS21

(does not include operating system)

ServicePac® Service Upgrade
3-yr onsite/9x5/
Next Business Day Response (#69P9509) $149

@server

IBM

Build your own NetVista desktop or IBM @server system.
IBM technology, your design.
Visit **ibm.com** for more details.

IBM NetVista Accessories

Belkin Wireless Keyboard and Mouse Kit	(#22P7139)	$40
256MB PC2100 CL2.5 NP DDR SDRAM UDIMM	(#33L3304)	$54
IBM UPS 500	(#33L3477)	$99
Targus DEFCON USB Fingerprint Reader	(#31P6763)	$120
15" TFT Flat Panel Monitor with system purchase	(#15TFTB1)	$299
Palm™ Tungsten™ T	(#22P7124)	$400

IBM @server xSeries Accessories

20/40GB TR7 Internal IDE Tape Drive	(#48P7042)	$549
256MB PC2100 CL2.5 ECC DDR SDRAM memory	(#10K0067)	$196
IBM Remote Supervisor Adapter	(#09N7585)	$499
APC Smart-UPS 700	(#94G3134)	$319

Upgrade your system with Microsoft® Office XP Small Business to Microsoft® Office XP Professional with Publisher.

1 866 426-1810 | ibm.com/shop/m521
Save on shipping, order online[6].

IBM recommends Microsoft® Windows® XP Professional for Business.

Warranty Information: For a copy of applicable product warranties write to: Warranty Information PO Box 12195, RTP NC 27709, Attn: Dept. JGVA/5200. IBM makes no representation or warranty regarding third-party products or services. Prices are in U.S. dollars and subject to change without notice. Reseller prices may vary. For ThinkPad and NetVista models without a separate video card, memory supports both system and video. Accessible system memory may be up to 64MB less than the amount stated, depending on video mode. 1MB = 1,048,576 bytes when referring to storage capacity. Access to capacity is less, up to 3GB is used in service partition. Some software may differ from its retail version (if available) and may not include user manuals or all program functionality. Software license agreements may apply. Telephone support may be subject to additional charges. For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician. Certain Microsoft® software product(s) included with this computer may use technological measures for copy protection. IN SUCH CASE, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product or upon certain reinstallations of the software product(s) or reconfigurations of the computer and may be completed by Internet or telephone (toll charges may apply). These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Services period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service call is dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For designated services requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2 hour service is not available in all locations. External peripherals such as radio, tape drives and channel controllers require their own separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. Maximum memory varies depending on model and may require replacement of standard memory with optional memory module. †Standard shipping included when you order online. Does not include services. U.S. only. All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation; an IBM Company. Intel, Intel Inside, the Intel Inside logo, Celeron, Centrino and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. © 2003 IBM Corp. All rights reserved.

SmartComputing
smartcomputing.com
In Plain English

Volume 14 • July 2003 • Issue 7

Focus On:

Printers, Scanners & Digital Imaging

54 Welcome To The World Of Digital Imaging

This month we peek at the hardware and software that makes it possible to take your own digital images and edit, print, post, or email them to friends and family.

56 Catch The Digital Camera Bug

Digital cameras are becoming as ubiquitous as computers, with 9.5 million digital cameras sold last year. So, what kinds of camera are people buying and what can you do with the pictures? We'll cover these topics and more right here.

60 Reality DV

Image quality and superior sound are two good reason to invest in a digital video camcorder. If you need a few more, read on.

64 Scan Your Way To Success

Even if you don't have a digital camera, you can scan the older photographs you have and send them to friends, edit out the scratches and flaws, or save them to CDs for safekeeping.

67 Image-Editing 101

There are a many image-editing programs available, and you can get a feature-rich package for a reasonable price. You can edit out red-eye, crop out that old boyfriend, or add a few special effects. We show you how we edited a few digital images using Jasc's $109 Paint Shop Pro 8.

70 Output Is King

Printing your digital images is another story, and we tell it right here.

73 Glossary Of Terms

Reviews

12 Tech Diaries

Our *Smart Computing* columnists spent some quality time with computer and computer-related hardware to get beyond the benchmark scores, statistics, and marketing hype. Find out what they liked and disliked about their choices inside.

18 The Roots Of All People

Genealogy research can quickly become an unorganized mess of names and sources. You can use genealogy software to manage facts about your ancestors. We evaluate four genealogy programs and choose our favorite for organizing and presenting family research.

21 Software

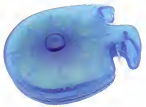
System:
Ashampoo WinOptimizer Suite 1.325 21

Multimedia:
Roxio VideoWave 5 Power Edition 22

Suites:
Corel WordPerfect Office 11 22

24 Impulse Items

Each month, we take a look at several useful gadgets and programs you can get for $20 or less.



Copyright 2003 by Sandhills Publishing Company. *Smart Computing* is a registered trademark of Sandhills Publishing Company. All rights reserved. Reproduction of material appearing in *Smart Computing* is strictly prohibited without written permission. Printed in the U.S.A. GST # 123482788RT0001
Smart Computing (USPS 005-865 /ISSN 1090 4170) is published monthly for $29 per year by Sandhills Publishing Company, 131 West Grand Drive, P.O. Box 85380, Lincoln, NE 68501. Subscriber Services: (800) 424-7300. Periodicals postage paid at Lincoln, NE. POSTMASTER: Send address changes to *Smart Computing*, P.O. Box 85380, Lincoln, NE 68501

PC Operating Instructions

26 Familiar Territory

Each month we bring you the latest WinXP update news and tips. This month, we cover one critical update, three security updates, and one recommended update.

28 Seek & Ye Shall Find

When you can't find the file or folder you're seeking, Windows Explorer's directory turns into a maze. Instead of running into brick walls, check out Windows 98's Find feature.

30 A Fresh Look At Windows 2000

Windows 2000 still enjoys strong support from loyal users. We'll take a fresh look at Win2000—what makes it unique and whether you should consider making the switch.

General Computing

34 Building A Computer: Smart Move Or Terrible Mistake?

There are some situations in which building your own PC is a good move, and many in which it's not the wisest choice. We'll help you decide which way to go.

36 How Did They Do That? Traditional Cake Makes An About Face

Find out how modern technology transfers your portrait (or any other image) from a PC to a frosting-laced cake.

38 The Digital Carry-On

Portable data storage devices let you store and transfer data. We help you find the right device.

41 The Ultimate Flat-Panel LCD Buyer's Guide: Part 1

If you're thinking about buying an LCD, you'll want to read our two-part guide so you can make a more informed buying decision.

Plugged In

44 The Wheel Deal

The power of the Web can help you find the information you need to get a good deal at your local car dealership. Here's how.

46 All-American Graffiti

Remember that old Lays Potato Chip commercial: Betcha can't eat just one? Well, that's kind of how Lileks.com is. You can't spend just one hour on the site; at least we couldn't.

49 Web Tips

50 Find It Online

PC Project

75 Old Time Rock 'N' Roll Made New

We show you how to move that old time rock 'n' roll to CD for easier storage and portability.

Quick Studies

77 Microsoft Excel 2002
Create Charts, Part I

78 Lotus 1-2-3
Between The Sheets

79 Quicken 2003 Premier
Use Quicken's Crystal Ball To Buy & Sell Securities

80 The Print Shop 15 Deluxe
Create Oversized Projects

81 WordPerfect 10
Accelerate Document Production With QuickWords

82 Microsoft Word 2002
Automate Mass Communication With Mail Merge

83 Quick Tips

SmartComputing.com

86 It Just Makes Cents

For $29 a year, you get more than just a subscription to a great publication; you receive a virtually endless supply of computing information from the *Smart Computing* print publication, two Web sites, and three sister publications. Start using SmartComputing.com to get the most value from your subscription.

Tidbits

92 Take Your Music On The Go

More and more MP3 players are cropping up. Check out this month's Tidbits to find out just what it is they can do for you.

Tech Support

94 Defensive Computing: The Real Score On System Restore

Computer expert and resident paranoid Alan Luber helps you avoid PC disasters.

96 Clash Of The Antivirus Apps

Two antivirus applications are definitely not better than one. In fact, they'll likely freeze your computer. We'll show you how to deal with the problem.

98 Examining Errors

This month, Tracy Baker resolves an error that results from digital camera software that conflicts with antivirus software, a problem with a Web cam and a hard drive, and a Works Suite error.

100 Quick Fixes

102 Q&A/FAQs

You have questions. We have answers. The *Smart Computing* staff responds to your queries.

107 Action Editor

Can't seem to get a response from a vendor or manufacturer? If you need help, we're here for you.

Each Month

7 Technology News & Notes
50 Find It Online
94 Tech Support
108 Sounding Board
Opinions On PC-Related Topics

Editor's Note

We're visual animals, and much of what we know about our world we perceive through our eyes. Visual metaphors are therefore deeply embedded in our language; in fact, it's difficult to speak or write for very long *without* using a metaphor having to do with sight, vision, or seeing. Think about how often we use phrases such as: "See what you've done?!" "He's a man of vision," "If you could just see things from my perspective," and "Ah, now I see what you meant."

This is a universal trait, not something present only in English. In Spanish, for example there's "Veré de hacerlo" (I'll see about [look into] doing it) and "Ya se ve" (It's obvious [literally "Now it is seen"]), among many others. The tendency toward visual metaphor is present in all languages, simply because our language is affected by how we *view* (there it is again) our world.

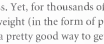
We use such metaphors because vision is so important to us. Because *imaging* is what we humans do to make sense of (and to communicate about) our world.

But it's not *just* a visual world, it's also a digital world.

Information is weightless. Yet, for thousands of years, the best way to disseminate it was to attach it to a good deal of weight (in the form of paper) and then pay to ship that weight all over the world. That's still a pretty good way to get information to people, but it's no longer the *only* way. Increasingly, textual, visual, and audio data are all being delivered digitally.

It was inevitable that the two would come together, of course. Because we're both visual animals and consumers of digital information, it's only natural that more and more of us are using digital imaging to create, modify, and share information.

But that doesn't mean that it's always simple. Computer-related imaging devices are still in their infancy. They're sometimes confusing to use and often subject to various glitches. This issue of *Smart Computing* will help you minimize the confusion and avoid or correct digital imaging problems, so that you can get out there and communicate digitally and visually. After all, one picture is worth . . . well, a lot of words, anyway, and a certain amount of effort. If you see what I mean.



Rod Scher, Publication Editor

Now Available On Newsstands . . .

Computer Power User · Top Performance Mods

Your computer is probably just a beige box that sits around looking bored. Learn how to quiet your machine while adding pizzazz with made-for-PC modifications. We also delve into the underbelly of the PC to squeeze every ounce of power out of your current machine. And that's just a sampling of the cover story.

Learning Series · Consumer Electronics Tips

This month we take a look at the fast-paced world of consumer electronics. We'll show you what to buy and how to use it, with more than two dozen pages of standalone and head-to-head product reviews and scads of step-by-step tutorials and tip articles. This issue has something for everyone from the casual gadget lover to dyed-in-the-wool electronics fanatics.

Reference Series · Windows A-Z

This huge issue is full of tips and tutorials for all of the most popular versions of Windows including 3.x/95/98/Me/NT/2000 and XP. You'll find installation help, troubleshooting advice, and step-by-step articles that show you how to get the most from your operating system.

Web Services
(For questions about our Web site.)
webhelp@smartcomputing.com
(800) 368-8304

Customer Service
(For questions about your subscription.)
customer.service@smartcomputing.com
Smart Computing
P.O. Box 85380
Lincoln, NE 68501-5380

Hours
Mon. - Fri.: 8AM to 8PM (CST)
Sat.: 8AM to 4PM (CST)
Online Customer Service and Subscription Center
http://www.smartcomputing.com

Authorization For Reprints
(800) 334-7458
FAX: (402) 479-2104

To Place An Order
Or Change An Address
(800) 733-3809
FAX: (402) 479-2193
http://www.smartcomputing.com

Editorial Staff
editor@smartcomputing.com
FAX: (402) 479-2104
131 W. Grand Drive
Lincoln, NE 68521

Subscription Renewals
(800) 424-7900
FAX: (402) 479-2193
http://www.smartcomputing.com

Advertising Staff
(800) 848-1478
FAX: (402) 479-2104
131 W. Grand Drive
Lincoln, NE 68521

Editorial Staff: Ronald D. Kobler / Rod Scher / Katie Dolan / Rebecca Christensen / Samit Gupta Choudhuri / Christopher Trumble / Kimberly Fitzke / Jennie Schlueter / Blaine Flamig / Raejean Brooks / Tara Weber / Sally Marek / Michael Sweet / Marty Sents / Chad Denton / Nathan Chandler / Calvin Clinchard / Kylee Dickey / Dana Montey / Josh Gulick

Web Staff: Corey Russman / Missy Fletcher / Cindy Pieper / Dorene Krausnick / Mary Lafferty

Customer Service: Travis Brock / Alisha Lamb / Brandie Humphrey / Becky Rezabek / Lana Matic

Subscription Renewals: Liz Kohout / Connie Beatty / Matt Bolling / Patrick Kean / Charmaine Vondra / Miden Ebert / Kathy DeCoito / Stephanie Contreras / Nicole Buckendahl

Art & Design: Lesa Call / Fred Schneider / Carrie Benes / Ginger Riley / Sonja Warner / Dave Fiala / Lori Garris / Jason Codr / Andria Schultz / Erin Rodriguez

Newsstand: Mark Peery / Garth Lienemann / Kelly Richardson / Erik Egeberg / Chris McGreer / Marcy Gunn / Jeff Schnittker

Advertising Sales: Grant Ossenkop

Printed with SOY INK

Sandhills Publishing

Introduce Your Friends To

Smart Computing

Smart Computing smartcomputing.com In Plain English

Help Them Discover That Membership Has Its Privileges

The Magazine Delivered To Their Door

- Troubleshooting Advice
- Hands-On Product Reviews
- Step-By-Step Instructions
- Performance Tips

Plus

FREE Access To SmartComputing.com

- Searchable 18,000-Article Archive
- Web-Only Articles
- Product Comparison Charts (See Back For Details)
- Q&A Board

ATTENTION SUBSCRIBERS

SmartComputing.com is the ultimate resource for computing tips, tutorials, and troubleshooting in Plain English!

FAX (402) 479-2193

PHONE (800) 733-3809

First issue mailed within TWO WEEKS

www.smartcomputing.com

Risk-Free Invitation

Yes! I accept your invitation to *Smart Computing*. I understand that if I decide to cancel my subscription at any time, I will receive an immediate refund for all unmailed issues NO QUESTIONS ASKED!

☐ 12 Issues $29 (USD$37 to Canada) ☐ 24 Issues $48 (USD$64 to Canada) ☐ 36 Issues $64 (USD$82 to Canada)

PLUS a Free copy of *Working With PC Files* with a PREPAID 24- or 36-issue membership.

Guaranteed Lowest Rate Available!

NAME

COMPANY

ADDRESS

CITY/STATE/ZIP

PHONE

EMAIL

PAYMENT OPTIONS (CHECK ONE)

☐ VISA ☐ MASTERCARD ☐ AMEX ☐ DISC ☐ PAYMENT ENCLOSED ☐ BILL ME (NO BONUS)

ACCOUNT NUMBER EXP. DATE

SIGNATURE

12269

Canadian Prices (USD) Include GST #BN123482788RT0001
Outside US/Canada Subscribe at www.smartcomputing.com

Give a gift of Smart Computing In Plain English

☐ 12 Issues $29 (USD$37 to Canada) ☐ 24 Issues $48 (USD$64 to Canada) ☐ 36 Issues $64 (USD$82 to Canada)

MY BILLING INFORMATION

NAME

COMPANY

ADDRESS

CITY/STATE/ZIP

PHONE

EMAIL

PAYMENT OPTIONS (CHECK ONE)

☐ VISA ☐ MASTERCARD ☐ AMEX ☐ DISC ☐ PAYMENT ENCLOSED ☐ BILL ME (NO BONUS)

ACCOUNT NUMBER EXP. DATE

SIGNATURE

SEND MY GIFT TO:

NAME

COMPANY

ADDRESS

CITY/STATE/ZIP

PHONE

EMAIL

12270

MESSAGE FOR RECIPIENT

Canadian Prices (USD) Include GST #BN123482788RT0001
Outside US/Canada Subscribe at www.smartcomputing.com

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 10 LINCOLN NE

POSTAGE WILL BE PAID BY ADDRESSEE

SMART COMPUTING
PO BOX 85380
LINCOLN NE 68501-9807

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 10 LINCOLN NE

POSTAGE WILL BE PAID BY ADDRESSEE

SMART COMPUTING
PO BOX 85380
LINCOLN NE 68501-9807

Which **digital camera** is right for me?
What features should I look for in a **printer?**
Which **scanner** is the best?

Find the answers to questions about these products and many more with SmartComputing.com's

Hardware Reviews & Comparison Charts

- **Search Hardware Reviews**
  You'll find thousands of reviews; dozens more added every month!
- **View Top 5 Listings**
  See what we consider to be the top five products in each category.
- **Create A Comparison Chart**
  Take a look at as many as five products and see how their features and specifications compare.
- **Find Out Where To Buy**
  See a list of up-to-date prices and places to buy the product.
- **Write A User Review**
  Share your experiences with a product to help fellow users make wise purchasing decisions.

www.smartcomputing.com

"Before I buy any hardware or software, I return to your Web site for product reviews. I always buy what you recommend, as you are right on target for non-power users like me. I'd still be in the cyber dark ages had I continued to use those uppity bookstore guide books."

—John W., Pinkerington, Ohio

Connect To The Internet Without Windows

You know you're a computer geek when you understand the ins and outs of your computer's **BIOS** (**Basic Input/Output System**; the software program that's stored in a chip on the motherboard and controls your PC's start-up process). But you don't have to be a computer geek to learn how an impending revolution in BIOS technology will alter the way you handle things should your computer crash.

Phoenix Technologies, undoubtedly the best-known BIOS manufacturer, makes BIOS products that are currently in more than 1 billion PCs worldwide. That puts the company in a prime position for its new BIOS technology, called cME (Core Managed Environment), to succeed. The BIOS is mainly responsible for making sure everything (hard drive, memory, keyboard, etc.) is working correctly whenever you turn on your computer. The cME adds some extra functionality to the BIOS that helps you troubleshoot problems, so you can call on the cME if you encounter problems when starting or running your PC.

Consider this scenario: Your computer crashes so badly that you can't boot up into Windows. You have a diagnostic program on your computer that can help identify the problem, but you can't run it because your PC won't start up. What are you to do?

The cME lets you run certain programs and do things such as run diagnostic programs, recover your original system settings, and even connect to the Internet without having to run Windows. There are four cME editions for different types of computers and digital devices; the PC edition should make its debut in many systems (Phoenix can't name names as yet) available in the United States sometime this fall.

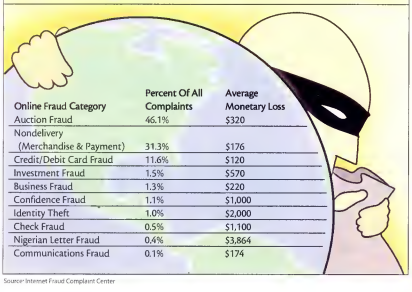
Phoenix has built a simple set of programs into the cME, which resides in a protected area of a hard drive, but system developers and manufacturers are free to tweak the cME and even add other programs. Because the cME can run without starting up Windows, some manufacturers plan to make it possible to play DVDs and CDs, among other things, without switching on your PC.

What A Rip!

Have you ever been swindled on the Internet? If so, filing a complaint with the IFCC (Internet Fraud Complaint Center; http://www1.ifccfbi.gov) is a good idea. A joint venture of the FBI and the National White Collar Crime Center, the IFCC tracks complaints and issues an Annual Fraud Report. Its most recent report tracks 48,252 complaints and states that online auction fraud is the most common problem and Nigerian letter fraud results in the most significant monetary loss.

Top 10 Complaints

Here's a look at the IFCC's top 10 complaint categories. Not all complaints involved an attack to the pocketbook, but the Average Monetary Loss figures below show the average reported loss for each category. Of the 16,164 Nigerian letter fraud complaints, 74 people lost money totaling $1.6 million.



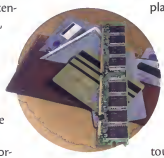
Online Fraud Category	Percent Of All Complaints	Average Monetary Loss
Auction Fraud	46.1%	$320
Nondelivery (Merchandise & Payment)	31.3%	$176
Credit/Debit Card Fraud	11.6%	$120
Investment Fraud	1.5%	$570
Business Fraud	1.3%	$220
Confidence Fraud	1.1%	$1,000
Identity Theft	1.0%	$2,000
Check Fraud	0.5%	$1,100
Nigerian Letter Fraud	0.4%	$3,864
Communications Fraud	0.1%	$174

Source: Internet Fraud Complaint Center

Illustrations: Andrea Schultz

5GB In Your Wallet

Smart cards, credit card-sized devices that store vital (usually personal) information, have received a lot of attention in recent years, especially since the attacks of Sept. 11, 2001. Companies such as Sun Microsystems have touted the use of smart cards for storing medical information and security purposes. Smart cards range in complexity from simple plastic cards with a magnetic strip to cards that have a built-in computer chip for storing a card carrier's biometric information such as a fingerprint or an iris scan.



A relatively new player in the smart card market, California-based StorCard, claims it's getting ready to produce its self-named StorCard device. The StorCard seems more like the stuff of science fiction than science fact, as its super-thin plastic shell reportedly contains its own processor and a spinning hard disk with capacities ranging from 100MB to a whopping 5GB. The company is touting the card for typical smart card uses (to store personal data, to help prevent identity theft, and others), as well as for securely distributing multimedia content, such as music and movies. If the card does what the company claims, it's likely to rank highly among the next big things in removable storage.

PDAs To Fight Bioterror

All varieties of PDAs (personal digital assistants), including Palm handhelds, HP iPAQs, and Handspring Treos, have made their way into the hot hands of thousands of U.S. physicians, but not just because they're cool gadgets for staying organized. PDAs also run software, such as ePocrates' Rx Pro, often praised as the best program going for providing quick access to all sorts of prescription drug and infectious disease information. Rx Pro also sends DocAlert messages to help doctors stay up to date on the latest drug and disease information.

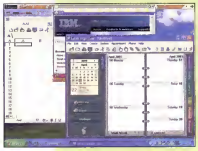
Now the HHS (Department of Health and Human Services) is working on a three-month study to see how well Rx Pro works for sending high-priority DocAlert messages to inform healthcare professionals about potential bioterror threats. The messages would warn of potential health threats from agents such as anthrax, botulism, plague, and smallpox.

And, as you might guess, these messages are associated with different threat levels depending on the severity of the information they convey. If the study goes well, and if HHS officials implement it, 250,000 doctors and 450,000 other healthcare providers could be set to receive such messages via their PDAs.

REVIEW

Lotus SmartSuite Returns

The latest SmartSuite from IBM/Lotus, version 9.8, includes all of the same features that earlier versions contained, plus a little more. It contains the same Lotus applications to which you're accustomed: 1-2-3 (for spreadsheet creation), Word Pro (for word processing), Freelance Graphics (for creating slideshow-style presentations), Approach (for building databases), Organizer (for managing contacts and schedules), FastSite (for creating Web pages), and SmartCenter (for keeping track of the Lotus programs and the files you create with them).



The "little more" includes features such as turning documents, spreadsheets, and calendars into Web pages more easily; Organizer support for vCard 3.0 (a new standard for electronic business cards); and a built-in Web browser. The browser works well, letting you access Web sites via SmartCenter without having to open a different program, such as Internet Explorer. SmartSuite 9.8 also includes a handful of bug fixes (for instance, your calendar won't suddenly roll back to the early 1800s when you're using the arrow buttons to go back to pre-2000 years).

If you're currently using SmartSuite version 9.6 or 9.7 at home, you won't find a whole lot in 9.8 to make upgrading worth your while. Business users, however, might appreciate the new enterprise-level installation features, which offer more customization options than earlier versions. Newcomers to Lotus, as always, will find a solid set of office applications.

SmartSuite 9.8 works with Windows 95/98/NT/Me/2000/XP; requires 16MB RAM for Win95/98/Me, 48MB RAM for WinNT, 64MB RAM for Win2000, or 128MB RAM for WinXP; and takes up roughly 290MB of hard drive space. Although the boxed version costs $224 (or $168 for the upgrade version), you can use IBM/Lotus's digital delivery system to download the complete version for $194 (or the upgrade version for $153).

SmartSuite 9.8

$224
IBM/Lotus
(888) 746-7426
http://www.lotus.com

Spam's Elusive Expiration Date

It's no wonder email users of all stripes have had it up to their ears with spam. A recent Ferris Research study estimated that spam cost U.S. corporations $8.9 billion in 2002 and that spam constitutes 15% to 20% of email sent to businesses. But if you think *you're* fed up with having an inbox that's inundated daily with spam, you should check out how megacorporations AOL (America Online) Time Warner and Microsoft are reacting to the rising tide of spam.

After refraining from initiating antispam legislation for nearly two years, AOL recently came charging out of the gate with five lawsuits aimed at more than 12 big-time spammers. According to AOL, these spammers are responsible for working around antispam filters and sending at least 1 billion unsolicited, often offensive, email messages to AOL subscribers. If AOL wins, the defendants could face civil penalties and pay as much as $10 million in monetary damages.

Microsoft took a somewhat different tack, opting to limit the number of messages its Hotmail users can send per day, according to a Reuters report. In the past Microsoft has permitted Hotmail users to send a maximum of 500 email messages per day. Microsoft reportedly dropped that number recently to 100 to thwart spammers who use Hotmail to send

unsolicited messages in bulk. We tried it ourselves, and sure enough, when we tried to send the 101st email message, a dialog box popped up saying, "You have sent the maximum number of messages allowed in a 24-hour period."

The Internet is home to many

Web sites offering various means of combating spammers. Newcomer Mailblocks.com (http://www.mailblocks.com) charges $9.95 per year for its service, which screens unknown email senders (and therefore a great deal of spam) by requiring the unknown sender to confirm he's a real person (something computerized spam generators can't typically do). Mailblocks .com lets you use Outlook or Outlook Express and keep your existing AOL, Eudora, Hotmail, or Yahoo! email account.

REVIEW

Big & Bright Without Breaking The Bank

Just two short years ago, you could expect to pay thousands of dollars (and often more than $10,000) for a decent digital projector. But despite inflation, the digital projector market has seen some very significant price drops. This is partly due to Texas Instruments' DLP (Digital Light Processing) technology, which lets manufacturers make bright projectors for less money than the traditional LCD (liquid-crystal display) and CRT (cathode-ray tube) projector technologies.

Now we have Dell's compact, 3.6-pound 3200MP. Its $2,199 price tag makes it one of the least expensive DLP models on the market, so we decided to put it to the test and see how it performed compared to its bargain basement price. It took less than 10 minutes to unpack the 3200MP and attach it to a notebook PC for testing. The projector comes with the cables necessary for using it with a computer, as well as the ports and cables for input from standard composite video and even HDTV (high-definition television) sources.

In a conference room setting, we viewed a PowerPoint presentation and parts of a movie on DVD and ran DisplayMate's Multimedia Edition testing software. The 3200MP provided bright, rich colors and precise, realistic imaging. It only required us to increase the brightness setting when displaying dark images.

The 3200MP has a brightness of 1,300 lumens, a native resolution of 1,024 x 768 and, depending on where you place it, creates an image between 25 and 293 inches (measured diagonally). Even at a higher price, the 3200MP would be a top projector pick.

3200MP

$2,199 • Dell
(888) 799-3355; (512) 338-4400
http://www.dell.com

Duly Quoted

"Nobody's going to do massive renovations so they can control their oven from the office. I would say, generally, a lot of this home automation stuff is a number of years out from reality."

—Forrester Research analyst Charles Golvin, commenting on expensive, high-tech "networked home" technologies that are likely to meet skepticism from most consumers. (Source: Boston Globe Online)

New Products

Compiled by Dana Montey

Quick takes on the latest hardware and software to hit the market at press time. Manufacturers' and publishers' release dates are subject to change, so some of the products may not be available when you read this.

Hardware

2GB CompactFlash Card

SanDisk • $499.99
Mega storage for your digital images
(800) 977-5427; (408) 542-0500
http://www.sandisk.com

CT60

Intermec Technologies • $4,850
Tablet PC designed for rugged environments
(800) 347-2636; (425) 348-2600
http://www.intermec.com

Deluo GPS For PC/Laptop (USB)

Deluo Electronics • $99.95
Navigation kit for your notebook or tablet PC
(877) 885-9090; (954) 572-5880
http://www.deluo.com

Hard Drive For The Car

If you want to listen to your MP3s in your car, you have to burn your MP3s to CD or hook up your portable MP3 player to your car stereo. With Perception Digital's 20GB PDHercules Digital Recordable Car Jukebox, you have a car-mountable, standalone jukebox that holds 300 hours of music. Use the included PDJockey software to transfer all your MP3s from your computer to the jukebox and take your tunes on the road with you. In addition, you can encode your CDs onto your jukebox straight from your car's CD player. The jukebox also comes in 40GB, 60GB, and 80GB capacities. ($399.95; 408/986-8113; http://www.perceptiondigital.com)

Enterprise Case

Belkin • $119.99
Convenient carrying case for your notebook PC
(800) 223-5546; (310) 898-1100
http://www.belkin.com

EPSON Stylus Photo 900

Epson • $199
In addition to photos, print directly onto CDs and DVDs
(800) 463-7766; (562) 981-3840
http://www.epson.com

EZ Bus 20GB

Apricorn • $159
USB 2.0 portable storage device
(800) 458-5448
http://www.apricorn.com

F173

TDV Vison • $399
17-inch LCD with solid steel base
(877) 878-4766; (626) 363-6160
http://www.tdvvison.com

Gallery 1740 Oxygen Mac & PC

Formac • $639
17.4-inch LCD with high color accuracy
(877) 436-7622; (510) 528-9300
http://www.formac.com

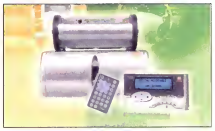
GR-HD1

JVC • $3,499.95
Digital Hi-Definition camcorder
(800) 526-5308
http://www.jvc.com

Hi-Speed USB 2.0 8-In-1 Media Reader And Writer

Belkin • $39.95
Supports eight types of media cards
(800) 223-5546; (310) 898-1100
http://www.belkin.com

PDHercules Digital Recordable Car Jukebox



iMic

Griffin Technology • $39.99
External sound card that connects to your computer via USB
(615) 399-7000
http://www.griffintechnology.com

Lola Direct Connect

x10 Wireless Technology • $49.99
Bring your PC's music to your television and stereo
(800) 675-3044
http://www.x10.com

Quadra 4-In-1 Pen

Belkin • $24.99
Multifaceted PDA navigation tool
(800) 223-5546; (310) 898-1100
http://www.belkin.com

ShuttleXpress

Contour Design • $59.95
Control multiple devices with this 5-button multimedia control device
(800) 462-6678; (603) 893-4556
http://www.contourdesign.com

Side Swipe II

Semtek • $175
Credit card reader for your cellular phone
(866) 573-6835; (858) 278-6003
http://www.semtek.com

SSPR-100

Quatech • $149
One-port serial PC Card with an attached cable
(800) 553-1170; (330) 655-9000
http://www.quatech.com

Visioneer Strobe XP 200

Visioneer • $299.99
Space-saving scanner that fits between your keyboard and monitor
(925) 251-6398
http://www.visioneer.com

xD-Picture Card Reader

PNY Technologies • $29.99
USB xD card reader that also reads SmartMedia cards
(973) 515-9700
http://www.pny.com

Software

Acrobat 6.0 Standard

Adobe • $299
Create PDF files with a click of a button
(888) 724-4508
http://www.adobe.com

Advanced Find And Replace 1.6

Abacre • $29.99
Search tool for searching almost any kind of file
support@abacre.com
http://www.abacre.com

AiS Watermark Pictures Protector

Watermarker Software • $35
Create watermarks for protecting your images
sales@watermarker.com
http://www.watermarker.com

Alive! Jigsaw Producer

YavSoft.com • $49
Create puzzles from videos or pictures
yav@yavsoft.com
http://www.yavsoft.com

Calendarscope 1.8

Duality Software • $29.95
Create then synchronize your calendar with your Palm OS PDA
cs@dualitysoft.com
http://www.dualitysoft.com

Circus Ponies NoteBook 1.0

Circus Ponies Software • $99.95
Mac OS X software for tasks such as creating outlines or taking notes
(415) 695-3100
http://www.circusponies.com

DeltaGraph 5

Red Rock Software • $299
Create 2D and 3D charts and graphs on your Mac
(888) 689-3038
http://www.redrocksw.com

DirectDVD 5.0

Orion Studios • $39.95
Software decoder for DVD audio and video playback
devteam@orionstudios.com
http://www.orionstudios.com

E-Z Human Resource Library

Made E-Z Products • $49.95
4-CD set with everything HR professionals need to know
(800) 822-4566; (954) 480-8933
http://www.madee-z.com

Word Menu

The Right Word

Are you struggling to find the right wording for your term paper or resume? Do you need help finishing that crossword puzzle? Take a look at Write Brothers' Word Menu, a comprehensive reference tool that helps you find and use words. The Treasury Of Glossaries includes more than 80,000 entries, and words are organized by subject matter. You can do a reverse dictionary search; instead of searching by word, search by meaning for the appropriate word. ($34.95; 800/847-8679; 818/843-6557; http://www.wordmenu.com) ❚❚

Namo WebEditor 5.5

Namo • $149/$139
Full-featured HTML authoring tool
(781) 279-2170
http://www.namo.com

PDF Producer

Data Becker • $49.95
Create PDF files that you can read using Acrobat Reader
(617) 614-0600
http://www.databecker.com

PentaSuite

PentaWare • $99.95
Software suite of tools for managing and compressing your files
(603) 929-9828
http://www.pentazip.com

Pocket Quicken 2.0

Intuit • $39.95/$29.95
Transfer Quicken information from your PC to your Pocket PC
(800) 952-2558; (520) 901-3220
http://www.intuit.com

RedBox Organizer 5.0

inKline Global • $39.95
Personal information organizer for a PC
(775) 747-5730
http://www.inklineglobal.com

ViRobot Expert

Global Hauri • $39.95
Antivirus software that detects and quarantines viruses
(408) 232-5463
http://www.globalhauri.com

WordFIX Pro

Cimaware Software • $149
Recovers damaged Word documents
(866) 849-0342
http://www.cimaware.com

WebPrint Plus For Windows

MacEase • $39.95
Save or print selections of text from anywhere, including Web browsers
steve@macease.com
http://www.macease.com

Nathan Chandler

Send insights and insults to Nathan at nathan@smartcomputing.com

Your World At Hand

A Samsung PDA/Phone With Power To Burn

I originally set out to test the Samsung SPH-I330 as simply a ramped-up version of a regular Sprint phone, albeit with Internet connectivity and a host of other functions. Little did I realize how overwhelming all of those features would be. The I330 isn't a phone with Internet capabilities—it's a full-blown PDA (personal digital assistant) that also happens to let you call your mom for an impromptu chat.

This sleek phone/PDA has a touch-sensitive, 256-color monitor, which works well with the included stylus. There's also a speakerphone to enable hands-free conversations; text messaging and Internet browsing capabilities; one-touch voice-mail access; 16MB of memory for your important information; voice dialing; and a custom-button mode that lets you program the I330's buttons into shortcuts, among dozens of other typical PDA features. Samsung crammed all of this into a product that measures about 5 inches high, 2.5 inches wide, and less than 1 inch thick. It's a tough package, too. I inadvertently slammed the I330 into a sidewalk with no ill aftereffects.

SPH-I330

Crisp Calls & Convolutions

You can use the I330 to make calls in an areas with digital or analog service, and because of the device's data capabilities, you can also access high-speed 3G (third generation) wireless to check email or your favorite Web sites. I started by making a few phone calls, a not-so-simple task considering the I330's complexity.

Icons (both on-screen and on buttons) are impenetrable hieroglyphics, especially when you're on the run and just learning to use the phone. Once I connected to a few friends, I found that the sound quality of my calls was very good, for digital anyway—as a Sprint customer in real life, I've acclimated to the intermittent skips and stutters that occur in areas with less-than-ideal digital coverage.

Data access was another story. Some days, I was able to check CNN's headline stories in just a few moments, other times it took a few minutes, and occasionally I couldn't access the Web at all. Such service inconsistencies were a definite minus.

I also didn't like the fact that it was hard to use my fingers to access PDA functions and to dial using the on-screen number keys. Sometimes I nailed the features I wanted right away, but often I needed the stylus; in other words, forget using stylus-dependent functions while you're on the freeway.

The I330 is better suited for use when it has your full attention. If you want, you can play a number of games, such as full-color golf and a number of mind-muddling puzzles. And if you're really paying attention, you will realize you can access a number of PDA functions even while you're talking on the speakerphone, handy for multitasking on hectic days.

As with many PDAs, the I330 has handwriting recognition software. The I330 often registered the wrong letters because in order to use certain letters (such as K), you have to use bizarre stylus strokes. To me, this seems backward; the machine is conditioning the man, when things really should be the other way around. You'll make other, similar compromises before you can take full advantage of the I330's power.

End Call

Sprint includes two lithium-ion batteries with the I330. It takes about two hours to charge one battery, which will last for about 100 hours on standby or for about two hours of talk time. The charger doubles as a data connection that lets you synchronize information with PC-based software such as Microsoft Outlook.

For me, the I330 test run was fun, but without a dependable Internet connection, I didn't find any features I couldn't live without. In spite of my lukewarm impressions, it's likely that harried businesspeople who need mobile access to all things Internet will like the tremendous potential the I330 offers. ■

For More Information

SPH-I330
$500
Samsung (sold by Sprint PCS)
(888) 253-1315
(913) 624-3000
http://www.sprintpcs.com

Cal Clinchard

Send your comments to cal@smartcomputing.com

Wider & Wilder

The Widescreen iMac Packs More Power

Let's get something straight. Former Vice President Al Gore did join Apple's board of directors, but he did not invent the iMac. I wouldn't blame him if he wanted to take credit for Apple's latest offerings, though, including the latest iMac, a 17-inch widescreen model.

Bright Side Of The Moon

Except for its peripherals, every bit of the iMac's components fit into a small, heavy, snow-white half-globe case. Its CPU, a 1GHz PowerPC G4, provides a fair amount of processing power but can't compete with the better, faster competition found in most full desktop systems. It does have some fast RAM, though: 1GB worth of DDR266 SDRAM (double-data-rate synchronous dynamic RAM, 266MHz). It also includes an 80GB hard drive and the Apple SuperDrive, which is really Pioneer's popular DVR-A05.

The SuperDrive combines 4X/2X/12X DVD-R/RW (DVD minus recordable/rewriteable) and 16X/8X/32X CD-RW capabilities and plays all standard DVD and CD formats. In my testing, the CD-RW burned 600MB worth of data (almost a full CD's worth) in less than four minutes. Those are pretty good speeds all around.

The iMac includes an NVIDIA GeForce4 MX graphics processor with 64MB of video memory, which is enough to handle all but the most demanding graphics tasks. Most design software and 3D games, for example, run nicely on the iMac, as do iMovie and iDVD, Apple's programs for video editing and DVD making. Other iMac features include an ergonomically curved keyboard, an optical mouse, and a ton of ports, including five USB (Universal Serial Bus) and two IEEE 1394 (FireWire).

The 17-inch widescreen LCD (liquid-crystal display) is the piece de la resistance. It renders razor-sharp text and rich, colorful imaging that doesn't fade when viewed at sharp viewing angles. Because it uses an extra wide 1,440 x 900 resolution, it plays letterbox DVD movies without displaying bars along the top and bottom of the screen, and provides plenty of room to show multiple program windows simultaneously.

iMac 17-inch SuperDrive

Apple Turnover

The iMac is so sturdy that you can lift it by the gooseneck that joins the system with its display. In fact, this is Apple's recommended practice for moving it or flipping it on its back to access the components inside. There's little room for upgrading the iMac, though, and virtually no room for upgrading the model I reviewed.

This brings up a good point: The basic 17-inch iMac starts at $1,799, but the model I reviewed costs $2,348 because it has been configured with all the best available parts. In addition to having the maximum amount of memory, it includes a Bluetooth module and AirPort Extreme Card for working with wireless devices and networks. The AirPort Extreme Card uses the latest 802.11g standard for wireless networking, which means that it works with compatible gear using the fast (54Mbps [megabits per second]) 802.11g standard, as well as Apple- and Windows-based systems that use the slower (11Mbps) 802.11b wireless standard. If you want to spend an extra $249, you can buy Apple's AirPort Extreme Base Station with modem and antenna support, which lets you make the most of the AirPort Extreme Card for setting up your own network for wireless Internet access, file sharing, and printing.

Bring It All Back Home

If you own a Windows PC and have contemplated switching to a Mac or adding one to your computer family, Apple continues to sweeten the pot with price reductions. What's more, Mac OS X v.10.2 (the Mac operating system popularly known as Jaguar) and the iMac software suite are friendly for PC users. For example, you can save AppleWorks documents and spreadsheets in Microsoft-compatible Word and Excel formats, and networking between a Mac and a PC is easier than ever. If you want to join the Apple family, now's a good time.

For More Information

iMac 17-inch SuperDrive
$2,348
Apple
(800) 692-7753
(408) 996-1010
http://www.apple.com

Dana Montey

Send Dana your opinions at dana@smartcomputing.com

Have It All

Good Things Really Do Come In Small Packages

Too often we hear the phrase, "You can't have it all." However, Panasonic's SV-AV30 comes close to giving you "it all" with the ability to record digital video, snap still pictures, record voice memos, and listen to MP3s.

The SV-AV30 stores everything on an SD (Secure Digital) card (64MB SD card included) and runs on a rechargeable battery. At 1 1/16 inches high x 2 7/16 inches wide x 2 15/16 inches deep, the SV-AV30 easily fits in your pocket. Design features include a 2-inch LCD (liquid-crystal display) and a built-in speaker and microphone. For accessories, the SV-AV30 includes ear bud headphones, a remote control for audio playback, a wearable carrying case, and an AV cradle for viewing contents on an external device, such as a television.

SV-AV30

Multifunctional

Video is captured in MPEG-4 (Moving Picture Experts Group, layer 4) format. You can choose from four quality levels: Super Fine, Fine, Normal, and Economy. The quality dictates the amount of recording time. For example, a 64MB SD card can hold eight minutes of Super Fine video or 35 minutes of Normal. Using the included USB (Universal Serial Bus) cable and SD-MovieStage software, you can transfer, view, and edit your video on your computer. SD-MovieStage can also be used to view and edit still shots and listen to voice recordings or MP3s.

Still photos are stored in JPEG (Joint Picture Experts Group) format at a resolution of 640 x 480. There are three quality levels: Fine, Normal, and Economy. When set on Fine, a 64MB SD card can hold 440 pictures.

With the included SD-Jukebox software, you can encode and transfer CD tracks. The MP3 player supports tracks encoded at bit rates of 64Kbps (kilobits per second), 96Kbps, and 128Kbps. On a 64MB SD card, the player holds approximately one hour of music.

The built-in speaker also functions as a microphone for voice recording. Whether you're taping your grocery list or a lecture, the voice recorder is a useful feature. You can record four hours of voice memos on a 64MB SD card.

Impress Me

I tried every SV-AV30 feature, and each worked as advertised. Right away I noticed that although the device is compact, it's easy to handle and navigate, and the LCD's picture quality is sharp. The image quality, however, isn't as sharp. Although image quality at the higher settings is decent, at lower quality levels, images are grainy. I then connected the SV-AV30 to my television using the AV cradle. I was able to view the contents of the SD card and record from the television.

When listening to MP3s through the built-in speaker, the sound was tinny. However, the included headphones provided some good sound. The quirky part about the MP3 player is that you must use the SD-Jukebox software to encode and transfer tunes and, to protect copyrights, the same tune can be transferred to the player only three times.

I also found that you can't delete or lock single files; it's all or nothing. And you can't delete MP3 files at all. To remove them from the player, you have to transfer them back to your computer. Lastly, to hook up the SV-AV30 to your computer, you must use the USB cable and the AC adapter.

All Is Good

For $399.95, the SV-AV30 offers you four ways to enjoy your investment. However, the SV-AV30 isn't going to replace your higher-end digital camera or camcorder. Image quality is good, but not great. If you're on vacation and can't wait to show off your parasailing escapade, use the SV-AV30 to capture the moment and email everyone a snippet of video, but don't expect that video to permanently memorialize your vacation. ||

For More Information

SV-AV30
$399.95
Panasonic
(800) 211-7262
(201) 348-7000
http://www.panasonic.com

Joshua Gulick

Send your comments to joshua@smartcomputing.com

Light Up The Room

Project Slides, Movies & Television At Home

When was the last time you pulled your slide projector out of the closet, dusted off 20 or 30 slides, and sat the family down to watch a slideshow? I'm guessing that your most recent slides are a little older than your digital camera. Digital photography lets you transfer oodles of quality digital pictures to editing software, remove a few red eyes, and add cute comments before a roll of film could reach the photo developer. But a digital camera and a computer make up only half of the necessary slideshow equipment. Even if you have a 21-inch monitor, family members will huddle around your desk for only so long. You need a digital projector.

BYOC (Bring Your Own Computer)

The good news is that you don't have to put individual slides into the projector tray anymore, but you will need extra equipment. To view your picture collection as a slideshow, you'll need to connect your computer (you now have a great excuse to buy a notebook) to the projector, and you'll need to buy and assemble a projector screen if you don't have a suitable wall. You don't need to buy the most expensive device on the market to project a quality image on your living room wall, but you should expect to spend more on the projector than you did on the slide projector.

ViewSonic's PJ501 lets you connect your computer or another video device, such as a VCR, DVD player, or HDTV (high-definition television), which means you can use the projector to watch television or movies. The PJ501 includes appropriate connection cables for each device. When you connect a computer to the PJ501, it acts as a second monitor, displaying your Desktop. If you don't have Windows XP (which has a built-in slideshow application), you'll need to buy a separate slideshow program.

Turn Off The Lights

At 1,500 lumens, the PJ501, which uses an LCD (liquid-crystal display) panel to display the image, isn't the brightest projector on the block, but it is bright enough to use at home. I flipped through a photo collection and watched several different movies in a lighted room. Then I turned off the lights and tested it again. I wasn't surprised to find that the projector displays the clearest image when I turned off the lights, but I liked the image in the lighted environment, as well. I could still read text from about 15 feet away when I turned on the lights. If you have trouble reading small text, you can use the Zoom feature on the remote control to enlarge a particular section of the screen. The projector performs almost as well in dim lighting as it does in complete darkness.

PJ501

In a dark room, I could see both photos and movies as clearly as I could on my notebook screen.

If the projector displays the image at an angle, you can turn an adjustable leg to straighten the device. The projector also uses digital keystone correction to keep the image level. Like slide projectors, the PJ501 has a fan that runs constantly. When you turn off the projector, the fan continues to run for a few minutes to cool the lamp. The PJ501 includes all the cables you will need to connect to a computer or video player. I like the carrying case, which has extra large pockets and a sturdy but comfortable handle.

You won't need to be a mechanic to keep the projector in good condition. You can easily remove a panel at the bottom of the device with a flat head screwdriver to replace the lamp. Overall, the PJ501 is a bright, easy-to-use projector. And at 5.4 pounds, you won't have any trouble carrying it to the next conference or family reunion.

For More Information

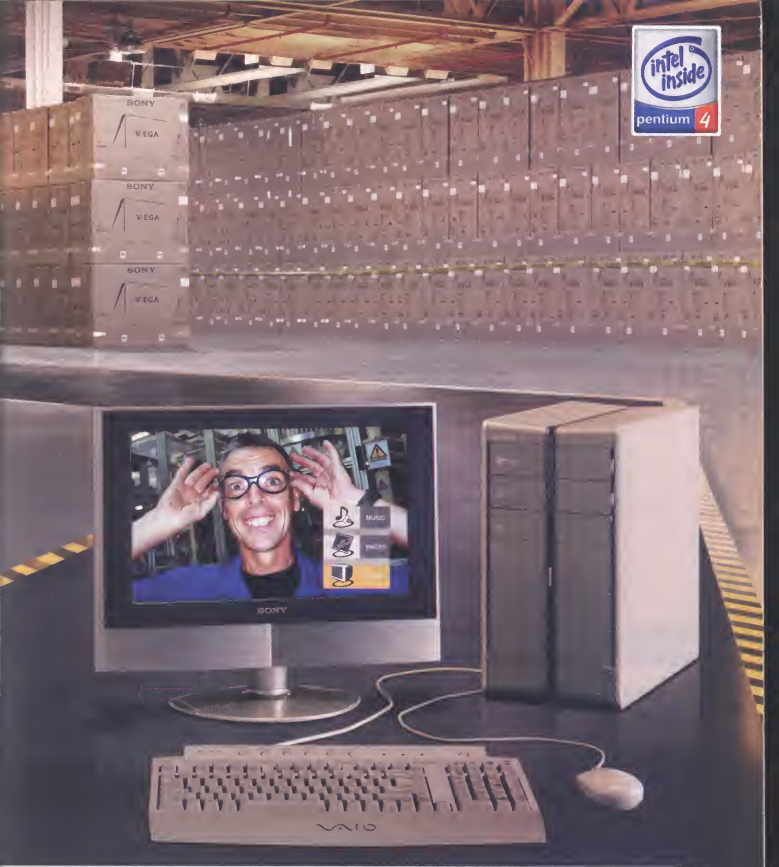
PJ501
$1,499
ViewSonic
(800) 888-8583
(909) 444-8888
http://www.viewsonic.com

The entertainment server.
It won't change your life.
Just the part of it you spend at home.

FACTORY
fresh

Personal computers have always been a solitary lot. Not anymore. The Sony VAIO PCG-RZ26G, powered by the Intel® Pentium® 4 Processor, has no interest in working alone. It's the newest of your home entertainment crew. The VAIO PCG-RZ26G burns CDs and DVDs, edits home

VAIO® PC PCG-RZ26G | HOME ENTERTAINMENT SERVER | INTEL® PENTIUM® 4



movies, downloads music and even captures TV broadcasts. And pairing it with the RoomLink™ network media receiver's GUI makes it easy to share a warehouse full of PC content with your home A/V components.† Your foreman is now on the clock. Let the entertainment begin. **www.sony.com/fresh**

SONY

PROCESSOR **SONY RECOMMENDS MICROSOFT® WINDOWS® XP**

The Roots Of All People

Genealogy Software Brings You Closer To Your Ancestors

July 2003 Smart Choice • Legacy Family Tree Deluxe 4.0

To the uninitiated, genealogy may seem like a dry topic. Those of us who have explored our roots, however, understand that genealogy is not only interesting but also addictive. Each answer seems to raise at least 10 more questions. A decade ago, keeping detailed paper records of genealogy research may have been possible. Today, however, with so many online genealogy resources, it can seem as if you're watering your ever-growing family tree with steroids. A good genealogy program can help organize an otherwise unmanageable stack of ancestor records. We'll take a look at the most popular programs and choose a Smart Choice for organizing and presenting a family history.

How We Tested

To test the software, we set 2,880 Scots-Irish relatives loose in each program. In other words, we imported a standard genealogy file called a GEDCOM (GEnealogical Data COMmunications) into each program. Our file contained information about a couple born in Scotland in the 1700s and 2,878 related individuals. This GEDCOM tested each program's ability to import files with minimal data loss. It also helped us determine how easy it is to navigate very large, complex family trees.

We checked for potential-problem notification features, amount of data visible on the Family and Pedigree views, and quality of source-citation features. We placed special emphasis on whether programs let us note individuals who never married or never had children. There is no point searching for family members who never existed.

All the programs we reviewed let us add photographs, sounds, and videos and included easy-to-use Web-publishing wizards. These features worked equally well in all programs. Finally, we printed the same descendant chart and family card in each program to see which created the most professional-looking documents.

Family Tree Maker Deluxe 10.0

$69.99
Broderbund
(800) 395-0277; (319) 247-3325
http://www.broderbund.com

Family Tree Maker is one of the most popular genealogy programs. We tested the Deluxe Edition, which comes with nine data CDs: the four-disc FamilyFinder Index (a guide to data CDs you can buy), the two-disc SSDI (Social Security Death Index) for 1937-1999, Family History: Mid-Atlantic Genealogies 1340-1940, Local and Family Histories: New England 1600s-1900s, and Military Records: U.S. Soldiers 1784-1811.

The FamilyFinder feature searches the bundled CDs and genealogy sites for matches to the individuals in your file. We let the FamilyFinder search run

over our 28.8Kbps (kilobits per second) modem. The search for the first 500 individuals took more than eight hours, so you'll probably want a broadband connection to use the online search.

The FamilyFinder found hundreds of promising results, but most cost money. The question is whether buying World Family Tree data CDs ($19.99 each) or an online subscription to the World Family Tree data ($49.99 annually) was worth it. In our case, the answer was no. Many of the results weren't true matches or contained no additional information. We could find much of the information on free services, such as RootsWeb (http://www.rootsweb.com) and the USGenWeb Project (http://www.usgenweb.com).

Family Tree Maker did create the most attractive charts and reports. It also let us note how relationships began and ended so that we wouldn't waste time in the future searching for nonexistent marriage or divorce records.

We liked the program's Export To PDF feature, which makes it easy to share information through email with others. The program imports PAF (Personal Ancestral File) files, as well as GEDCOMs. It also includes a spell checker and potential-problems report.

There are several ways Broderbund could improve Family Tree Maker. First, we would like a way to note if a couple never had children. We also couldn't help but notice that this was the only program we reviewed in which you cannot see the names of a couple's parents in the Family view. Also, for a week, Family Tree Maker's "helpful" dialog boxes continued to pop up and present tips on every screen, no matter how many times we selected Do Not Display This Message Again.

None of the four programs we tested recognized the Hobbies tag from our GEDCOM, but Family Tree Maker was the only program that seemed to delete the data. If Great-Grandfather Charles' love of hunting and fishing was recorded in any note, field, or error log, we couldn't find it.

Legacy Family Tree Deluxe 4.0

$29.95 ($19.95 for download)
Millennia
(800) 753-3453; (425) 788-2121
http://www.legacyfamilytree.com

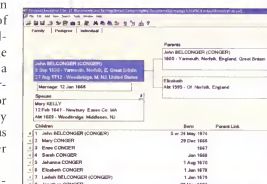
Legacy Family Tree's Family view shows Husband and Wife cards with dates, locations, and facts for each. Above each spouse card are the names and birth and death dates for each of the spouse's parents. Below the spouse cards is a Marriage button with the date and place of marriage. Legacy lists children below the Marriage button. You can tell at a glance which children married or had children of his or her own. This was the only program we found that let us mark that a couple never married or had children.

Legacy includes an Import Wizard that recognizes GEDCOM, PAF, and Ancestral Quest files. When Legacy encounters GEDCOM tags it doesn't recognize, it offers to convert each to a known tag or attach them to note fields. This essential feature prevented data loss and kept genealogy information linked with the correct individuals rather than locked away in an error report.

Several icons are at the bottom of each spouse's card. A number accompanies the Spouse, Siblings, and Parents icon so you can quickly see how many spouses, siblings, or sets of parents each person had. Legacy also has detailed bibliographic fields, letting us create citations for specific dates and facts.

Of the four programs, Legacy has the most detailed Pedigree view. In addition to ancestors, it shows the individual's spouse, children, and siblings. As with Family Tree Maker, Legacy includes a spell checker, exports to PDF format, and generates potential-problem reports.

Legacy has several unique features. The Chronology view creates a timeline of events (such as birth, graduation, marriage) for the selected individual. We also liked Location Notes, which let us add historical information about locations to our files. For instance, adding Location Notes about the history of Bucks County to a marriage field may aid future research and adds a human-interest element to a family history. Legacy also lets you print blank questionnaire forms, complete with a note introducing yourself and your research.



Personal Ancestral File 5.2

$6 on CD-ROM (free download)
Church of Jesus Christ of Latter-Day Saints
(800) 537-5971
http://www.familysearch.org

PAF is the official genealogy software of the Church of Jesus Christ of Latter-Day Saints. Genealogy plays a key role in the beliefs of the church's members. In fact, the LDS church developed the GEDCOM standard and has a number of Family History Libraries throughout the world.

Therefore, no evaluation of genealogy software would be complete without a review of the latest version of PAF.

PAF has several limitations. The Family view doesn't show details about children, such as the individual's gender or whether she had any children of her own. There is also no way to note that a person or couple had no children. You can, however, tell if an individual had other spouses and if there is additional information about parents or children.

You won't see many details in the Pedigree view, but placing the pointer over a name displays birth, marriage, and death dates. Click the name to also view the spouse and children.

Navigation of Family and Pedigree views isn't as intuitive as in other programs. Rather than clicking or double-clicking a name to navigate the family line, you have to click the arrow next to the name. Also, adding sources wasn't as intuitive as in other programs, but it was possible to note the source of individual facts.

When PAF encounters unknown GEDCOM tags, there is an option to automatically add the unrecognized data to individuals' Notes fields. PAF exports to GEDCOM 5.5, Ancestral File, Pedigree Resource File, and to PAF for Palm OS handhelds.

Heritage Family Tree Deluxe 2.0

$39.95
Individual Software
(800) 822-3522; (925) 734-6767
http://www.individualsoftware.com

The final program we reviewed was Heritage Family Tree Deluxe, a program that looks eerily like PAF. The interface is the same, except that Heritage squishes some extra information onto its screens. For example, the Family view is identical, except that Heritage includes a Marriage button. There is also an Add Spouse button on the screen.

Many of PAF's weaknesses are also weaknesses of Heritage. You can't see the sex of children from the Family view, and you also can't select Never Married or No Children. Heritage lists all unknown tags in a GEDCOM Import Log, which preserves the data but keeps it at arm's length rather than linking it to the proper individuals.

Heritage has two real strengths. First, you can easily add sources by clicking the S button next to any field. Second, although Heritage's interface looks like PAF, navigating Heritage is more intuitive.

Heritage includes bonus CD-ROMs (not available when you download the software from the Web site). The first, SSDI, is rather pointless because you can find more up-to-date records at RootsWeb's Social Security Death Index Interactive Search (http://ssdi.rootsweb.com). The second disc is a collection of photos from England, Wales, Scotland, and Ireland.

Final Word

All of these programs will do what you need them to: record genealogy data, organize research, and present family histories to others. However, all family-tree software is not created equal. You don't have to spend a lot of money to get a great genealogy program. The free download of PAF will suffice. There's no need to spend $39 or more on software. The bonus CDs that came with Heritage Family Tree and Family Tree Maker weren't useful enough to justify the added cost, especially with so much genealogical data available online.

Legacy Family Tree's interface is straightforward. Family and Pedigree views both presented a wealth of genealogy data at a glance without cluttering the screen. It is easy to add source citations, and the program has several unique capabilities, such as the Location Notes. Legacy also let us split the screen so we could view and compare two family files.

Often when a "budget program" wins a Smart Choice award, it is not because it is the best program but because it is has the best value per dollar. Millennia Legacy Family Tree, however, was the program we most enjoyed using, and the low cost was merely a bonus. Therefore, we declare it the Smart Choice for experienced and aspiring genealogists. ■

BY KYLEE DICKEY

Buying Tips

All genealogy programs should support exporting and importing GEDCOM (GEnealogical Data COMmunications) files, making it possible to share files. If you often collaborate with a certain individual, you might consider a program that can import the type of files that person's program generates.

Be wary of spending extra money for data CDs. Often, you can find the information elsewhere. For instance, two of the programs we reviewed came with the SSDI (Social Security Death Index), a database you can access for free at http://ssdi.rootsweb.com. RootsWeb's records are more up to date and easier to search.

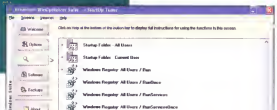
As your family tree grows, it is impossible to remember the source of individual facts. It is easy to resolve conflicting data if you have good source citations. Look for a program with detailed and easy-to-use citations.

A great way to interest others in your family research is to place ancestors' pictures in your charts and reports. Give your charts and reports a personal touch by selecting software that lets you insert image files.

All-Purpose Cleanser For Your PC

WinOptimizer Suite 1.325

$39.99
Ashampoo
+0049 +441 93379-0 (Germany)
http://www.ashampoo.com



Here's one way that a computer is similar to a car: The more (and the longer) you use it, the more maintenance it requires. If you bought a brand new computer a few years ago and only use it once a week to write a letter, it's akin to the car that gets used once a week for a trip to the grocery store. After a while, you might need to give it a good dusting, but the internal parts are probably still in great shape. On the other hand, if you use your computer frequently, or if you've used it often for a number of years, it could benefit from some internal cleanup.

That's where Ashampoo's WinOptimizer Suite 1.325 comes into play. It contains seven programs good for cleaning up and optimizing your computer. The suite works with Windows 95/98/NT/Me/2000/XP and takes up 17.8MB of hard drive space. We installed and tested the entire suite on an IBM system with a 667MHz Pentium III processor, 192MB RAM, and a 10GB hard drive.

The Cleaning Crew

The Drive Cleaner and Internet Cleaner programs provide the simplest and safest means of removing unnecessary files from your hard drive. Getting rid of such excess fat from your computer will cut down on the time it takes your hard drive to access information it is actually looking for, and it frees up some extra hard drive space you might not have known was available. When you first launch the WinOptimizer Suite, the Welcome screen appears and lists the seven programs the suite contains. Just double-click the name of the program (or, in Ashampoo parlance, the module) you want to use, and it will launch in its own window.

Drive Cleaner is similar to the suite's other modules in that you can use it one of two ways. You can launch the module and click a button to let it do its thing (in Drive Cleaner's case, searching for redundant files, such as old temporary files, and deleting them), or you can tweak settings to customize the way it runs. With Drive Cleaner, you can identify drives and folders to include or exclude from the cleanup process, assign filters based on file name and file extensions, and adjust other settings. You can also run Drive Cleaner in Turbo Mode, which is faster but doesn't display the files being scanned while the program runs.

Internet Cleaner, which finds and deletes temporary Internet files from your computer, is the weakest of the suite's modules. You can do the same thing using Windows' built-in Internet Options feature. In contrast, the suite's Registry Cleaner is especially handy because maintaining the Windows Registry requires more technical knowledge and manual tweaking to do the job right. Still, it is best to back up your computer before using any program that modifies the Registry. An additional cleanup module, the DLL Cleaner, is recommended for advanced users only.

Special Forces

Internet Tuner is the suite's most complicated module to use. It helps optimize your Internet connection if you use a modem and TCP/IP (Transmission Control Protocol/Internet Protocol). It comes with detailed guidelines and can help if you have an especially slow Internet connection, but in our tests, it didn't improve performance.

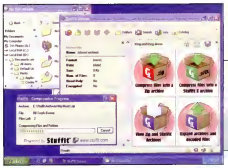
We found the StartUp Tuner and File Wiper modules most useful. StartUp Tuner helps you control what programs automatically run when you start Windows, but you can accomplish that fairly easily on your own. StartUp Tuner's better feature is that it helps remove remnants of old programs that you have deleted from your system. Finally, File Wiper lets you permanently delete files from your computer. Without such a program, whenever you delete files, they actually remain on your hard drive until the drive runs short of room and writes over the resident data.

Final Analysis

We found every program in the WinOptimizer Suite effective and easy to use. The online help is great, as well; it's thorough and intuitively laid out so you can quickly find answers to questions that might arise when using the programs. Ashampoo is located in Germany and doesn't offer telephone technical support, but it does offer email support and promises to respond within 48 hours to email requests. You can download the suite or order it on CD via the Ashampoo Web site, or you can download a trial version that works for 30 days. ■

BY CAL CLINCHARD

Who Wants To Ride This Wave?



VideoWave 5 Power Edition

$99.95
Roxio
(866) 280-7694
(408) 848-5594
http://www.roxio.com

Roxio has acquired a taste for video editing. It offers not one, but two video-editing programs for consumers. VideoWave Movie Creator is for video-editing novices, but VideoWave 5 Power Edition is designed for those more serious about video editing. The program has some nice features, but its greatest weakness is too noticeable to ignore.

VideoWave 5 Power Edition's interface looks pretty simple. There's a Storyboard section along the top of the interface where you can post and arrange video clips. Below that is the Library window, where you can load and select video and audio clips. The program's preview window appears to the right of the screen, and there is a Mode Selector along the left side.

The Mode Selector contains several icons for accessing various tools, such as transitions and text effects. There are also icons for the Cutting Room, the Darkroom, and the Video Mixer.

One thing is noticeably lacking from VideoWave 5 Power Edition's interface: a timeline view. We think a timeline view is essential to tweak the length of video and audio clips and other effects in relation to the rest of the video. Without a timeline view, working with clips and effects is more difficult than it needs to be.

Having said that, the program does have some nice features. We like the Darkroom effects, where you can change the color scheme of a video clip. With the Video Mixer, you can overlay video clips with varying degrees of transparency.

As with most new video-editing programs, you can save your video as a DVD. Or you can save it to a VHS tape or to a CD.

Although we like some of the features in VideoWave 5 Power Edition, we're not very fond of the program overall. A timeline feature would make this program much more user-friendly. There are other good video-editing programs out there that include this feature, so we can't recommend spending $100 for this program. ▮

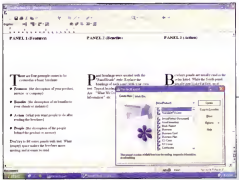
BY MICHAEL SWEET

An Office Suite Alternative

If you imagine a blue document and gray text when you think of Corel WordPerfect, you can think again. Corel, which continues to compete with Microsoft in the office suite arena, launched the feature-laden WordPerfect Office 11 (standard edition) in April. The suite's main applications include WordPerfect 11 (a word processor), Quattro Pro 11 (spreadsheet), and Presentations 11 (presentations and graphic editor).

Corel is offering the full version of WordPerfect Office 11 for $299.99 and the upgrade version for $149.99. You are eligible for the upgrade version if you already use certain previous versions of Corel WordPerfect Office, Microsoft Office, Microsoft Works, and some other office applications. WordPerfect Office is significantly cheaper than its Microsoft competitor. Microsoft Office XP Standard ($499) includes several of these types of programs, including a word processor, presentation editor, spreadsheet, and an email management program. WordPerfect Office does not include an email application.

Microsoft Office users will find WordPerfect Office 11's GUI (graphical user interface) familiar. Most of WordPerfect's toolbar icons are easy to understand. If you don't recognize one, you can move the pointer over the icon to display a text label. We liked Corel's headache-saving tips. When we clicked File, Hide Bars, a message explained that this feature hides all of the toolbars. For additional help, refer to the Help files, which include tutorials for tasks within each program. You can toggle through Small, Normal, and Large fonts in the Help files and tutorials.



The suite has several small applications and features. If you like to use templates to build letters and other documents, you'll enjoy PerfectExpert, the suite's project application. Once you select a project, it opens the template in the appropriate application. And yes, you can switch to WordPerfect 5.1's blue screen layout if you really want to. ▮

BY JOSHUA GULICK

WordPerfect Office 11

$299.99
Corel
(800) 772-6735
(613) 728-8200
http://www.corel.com

HDD

A 120GB INSURANCE POLICY FOR YOUR DATA.

The Iomega® HDD 120GB desktop hard drive. Because sometimes bad things happen to good data.

- Full system data backup works to protect your entire hard drive
- Iomega Automatic Backup means you'll never have to lift a finger
- Norton Ghost™ 2003 helps you recover from any disaster ($70 value)
- Storage capacities for every need from 40GB up to 120GB

FOR DETAILS VISIT GO.IOMEGA.COM/HDD3

- **$20 OFF AN IOMEGA HDD DESKTOP HARD DRIVE* – VISIT GO.IOMEGA.COM/HDD3 FOR DETAILS**

SIMPLE STORAGE FOR A COMPLICATED WORLD.

IOMEGA HAS AN ENTIRE FAMILY OF SMART DATA STORAGE SOLUTIONS FOR YOUR EVERY NEED

Iomega Mini USB Drives

Iomega Zip® Drives

Iomega CD-RW Drives

Iomega NAS Servers

iomega®

www.iomega.com

*$20 mail-in rebate available on select Iomega HDD desktop hard drives from April 1, 2003 through May 31, 2003. Go to iomega.com/promos for details. ©2003 Iomega Corporation. All rights reserved. Iomega, the stylized "i" logo and Zip are either registered trademarks or trademarks of Iomega Corporation in the United States and/or other countries. Norton Ghost is a trademark of Symantec.

Compiled By Joshua Gulick

Impulse Items

Cool Stuff For Less Than $20

See it, like it, buy it. Impulse Items are products that capture your attention but won't make you dig too deep into your wallet. Check these pages each month for the latest interesting and inexpensive computing items we've run across.

C.H.I.M.P.

If a family member has ever walked into the room just as you were ordering the perfect holiday gift, you know how hard it is to cover a monitor screen with a single hand. The C.H.I.M.P., which stands for Chimp Has Invincible Monkey Powers (don't ask us) acts as a rearview mirror. The C.H.I.M.P. includes a strip of Velcro, so you can attach it to your desk or monitor. Buy the C.H.I.M.P. for $9.99 at ThinkGeek (http://www.thinkgeek.com).

Cable Tunnel Organizer

If you have a curious pet, you probably already know that the loose computer cords dangling behind your desk are hard for him to resist. Keep your cords organized and safe by running them through Belkin's (http://www.belkin.com) Cable Tunnel Organizer. The Organizer covers only a small portion of your cables, but your pet will probably be less interested in a thick bunch of cables than a tantalizing loop. The Organizer holds as many as seven cords in plastic slots. Use the adhesive strips to mount the Organizer on your wall or desk and then

install the unit's four screws to keep it in place. The Organizer includes a lifetime warranty. You can buy it for $14.99.

Battery Saver Wrist Pad

Wireless keyboards and mice clean up your desk surface, but don't expect them to be hassle-free. Wireless optical mice and some corded optical mice require batteries. Unless your mouse includes a charger, you'll need to switch out the batteries as often as once every other month. If you'd like to spend less time performing mouse surgery and more time mousing, consider Kensington's (http://www.kensington.com) Battery Saver Wrist Pad. The pad's special surface lets the beam track accurately while using less battery power. You can buy the mouse pad (which includes a separate gel wrist rest) for $19.99.

Travel Laptop Cord

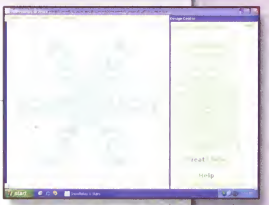
Museum gift stores always offer plenty of unique treats, but few include functional computer gear. MoMA, the Museum Of Modern Art (http://moma.org), has a few techie gifts up its sleeve at the MoMA Online Store (http://momastore.org), including a retractable phone cord. If you connect to the Internet through hotel phone lines while traveling, you probably stash an unwieldy phone cord in your notebook case. The Travel Laptop Cord hides the phone cord in a sleek, blue case smaller than a hockey puck. To pack it up, simply push the button. Buy the Travel Laptop Cord for $10 ($9 if you are a MoMA member).

Goobs

If you shy away from gory video games, take a look at Redclaw Software's (http://www.redclawsoftware.com) Goobs. Goobs are friendly, well, Goobs, who can't find their way out of intricate traps. Your mission is to rescue the Goobs by leading them through one-way doors, over pits, and past lasers to safety. You can use the Goobs (which hop from tile to tile) to push boxes or throw levers. Goobs can run full-screen or in a window, so you can play Goobs while keeping an eye on chat messages or other programs. The downloadable trial version has 10 levels. The full version costs $19.95 and includes 50 new levels. The full version also includes a 30-day money-back guarantee.

Snap! Pool

You don't have to be a pool shark to enjoy Topics Entertainment's (http://www.topics-ent.com) Snap! Pool. The training feature lets you practice or warm up before you start a game. You can improve your aim by using the Ball Path feature, which displays a white line extending from the cue ball to the ball in front of it. You can also use the Ball Path feature to even the odds against a particularly tough computer opponent, but keep in mind that you'll still miss the shot if you hit the cue ball too hard or too soft. Snap! Pool lets you play against a computer player or friends (if you have a LAN [local-area network]), and at $4.99, probably costs less than a few hours of pool time at your local hall.



Snowflakes & Stars 3.1

If your children are hogging the computer when you need to work, visit Royal Lyon (http://royallyon.com) and download the evaluation version of Snowflakes & Stars. The Create New button starts a random pattern, and the additional buttons let you adjust other characteristics, such as line length. The software lets you create intricate designs by clicking the pointer at various points on the picture. You can click randomly to create unique stars or snowflakes or you can create a specific pattern. Once you complete a design, just print it out and let the children color it in. You can try Snowflakes & Stars free or register it for $9.95 to unlock the Print feature and extra designs. Royal Lyon plans to offer registered users free future upgrades.

Familiar Territory

Since Microsoft released Windows XP in October 2001, every month has seen the arrival of a few new WinXP Updates (Microsoft's term for patches). Let's take a look at the current crop of updates. As long as you have an active Internet connection, you can obtain these updates by clicking Start, All Programs, and Windows Updates and following the on-screen instructions. Download times are approximate using a dial-up connection.

Microsoft Virtual Machine

This update, 816093 Security Update Microsoft VM (Virtual Machine), is similar to the one we described in the January 2003 issue of *Smart Computing*. It corrects a problem with Microsoft VM that could let a cracker take control of your computer. According to Microsoft, this is a critical security update affecting Windows 95/98/98SE/Me/2000/XP and Windows NT 4.0 users. It's 5.1MB, takes about 28 minutes to download, and requires that you restart your computer. Once installed, this update cannot be removed.

Internet Explorer 6

If your computer's OS (operating system) is WinXP Home or Professional Edition, Windows 98/98SE/Me/2000/NT 4.0 *and* you're running Internet Explorer version 6 SP1 (Service Pack 1), you should download and install the 813951 Update For Internet Explorer 6 SP1 update. It corrects problems with a previous update titled 810847 February 2003 Cumulative Patch For Internet Explorer 6 Service Pack 1, so install that before you install the current update. Problems you might experience without these patches include error messages when using an MSN email account and repeated requests to enter a username and password when trying to access Web sites from within such programs as Windows Media Player. The update is 345KB, takes about two minutes to download, and requires that you restart your computer. Once installed, this update cannot be removed.

Prevent Attacks

The 331953 Security Update addresses an issue that can potentially let a cracker use the RPC (remote procedure call) protocol to launch a DoS (denial of service) attack (that is, to make a networked computer or server temporarily unusable by flooding it with meaningless data). Under normal circumstances the RPC protocol is used in a network environment to let one computer safely run programming code on another computer. The security risk comes about when a cracker uses the Internet to exploit an RPC-related security hole and use an affected PC to launch a DoS attack. This problem has generated some controversy in the WinNT world because, at press time, there is no patch available for WinNT 4.0. The 331953 Security Update, however, works with WinXP (Home, Professional, and 64-bit editions) and Win2000 (Professional, Server, and Advanced Server versions). It's 824KB, takes about four minutes to download, and requires that you restart your computer.

Web Security

When we receive an email message that contains a hyperlink to a Web site, we often think nothing of clicking it. This can lead to problems, though, when the Web site you access lets a malicious user exploit a security hole on your computer and run whatever programming code he wants without your consent. The 814078 Security Update fixes just such a problem for most Win98/98SE/NT/Me/2000/XP users. It's 361KB, takes about two minutes to download, and requires that you restart your computer. Once installed, this update cannot be removed.

DirectX

Microsoft's DirectX is an API (application program interface; a library of commands and functions programmers use when creating certain kinds of programs) that simplifies the process of designing multimedia software for computers running Windows. Many PC-compatible graphics, audio, and video programs, as well as 3D games, are built using DirectX. The new DirectX 9.0a End-User Runtime update is more of a version update than a patch, but it does resolve a few problems, including issues with multiplayer games and MSN Messenger. It's 291KB, takes two minutes to download, and requires that you restart your computer. Once installed, this update cannot be removed.

BY CAL CLINCHARD

WinXP Tips **Since WinXP's release, we've encountered dozens of tips for enhancing and customizing WinXP. Here are a few especially handy ideas that work with both WinXP Home Edition and Professional Edition.**

Make A Fast Switch

If you have more than one user account set up on your WinXP computer, this tip might interest you. WinXP's Fast User Switching feature lets you quickly switch from one user account to another without having to close all running programs and completely log off before making the switch. Unless your computer has 64MB RAM or less, this feature should already be established on your computer. This is significant because Fast User Switching is a memory-intensive feature, which is why WinXP works noticeably slower when two or more users are running programs simultaneously.

If you'd prefer to turn off Fast User Switching and force users to log off completely before switching to a different user account, click Start and Control Panel, and double-click the User Accounts icon (you might have to click the Switch To Classic View link before you can see the User Accounts icon). In the User Accounts window under Pick A Task, click the Change The Way Users Log On Or Off link. In the next window, uncheck the User Fast User Switching checkbox, click the Apply Options button, and close the User Accounts window.

Transform Windows Into Silver

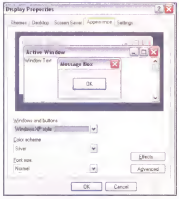
You've undoubtedly seen the standard issue WinXP Desktop theme with its green hills, bright blue sky, and brilliant white clouds. If you click Start, Control Panel, and double-click the Display icon (you might have to click the Switch To Classic View link before you can see the Display icon), on the Themes tab you can see that this theme is named simply Windows XP. There are other themes from which to choose, but regardless of the theme you use, you can still modify window colors. If you then select the Appearance tab and look at the options under Color Scheme, you'll notice two schemes, neither of which were available in earlier Windows versions: Olive Green and Silver. Select one and click Apply to see the effect. When you're finished making changes, click OK.

Compress Files & Folders

WinXP comes with a built-in data compression feature for zipping (making a file's size smaller) uncompressed files and unzipping (decompressing) compressed files. Right-click the Start button and select Explore to open Windows Explorer. Locate the file or folder you'd like to compress, right-click it, and select Send To and Compressed (Zipped) Folder. This works well with most file types with the exception of image files (which are difficult to compress) and audio files (which are already compressed). This procedure comes in handy if you want to save space on your hard drive or reduce a file's size before saving it on a floppy diskette or sending it as an email attachment.

Once you have a compressed folder, you can rename it the same way you would an ordinary file: Locate it in Windows Explorer, right-click it, select Rename, type the new name, and press ENTER. You can also drag and drop additional files into the compressed folder (it makes a zipped copy of the file, so don't worry about the file disappearing into the compressed folder). To open the compressed folder, simply double-click it. In the window that opens, you can double-click an individual file to open it; open a number of files simultaneously by holding the CTRL key, clicking each file you want to open, and then pressing ENTER. Or you can open all the files at once by selecting Extract All from the File menu.

You can also password-protect a compressed folder. Double-click to open it and select Add A Password from the File menu. In the Add A Password dialog box, type a password in the Password field, retype the password in the Confirm Password field, and click OK. Now you will have to type that password before you can open any file within the compressed folder.



Tired of the standard WinXP bright blue window title bars? Turn your windows and Start menu silver or olive green by opening Display Properties and selecting the desired option under Color Scheme.

Show The Desktop

Here's one last little tip you might find useful. In earlier Windows versions, if you had a bunch of windows open and wanted to quickly access the Desktop, you would right-click a blank area on the Taskbar and select Minimize All Windows. In WinXP, it's a little different: Right-click a blank area on the Taskbar and select Show The Desktop. ❚❚

Seek & Ye Shall Find

Do you find yourself searching for your car keys every morning? Forgetting where things are and spending time looking for lost items is part of life. Things get misplaced all the time, and computer files are no exception. Windows 98 has a built-in Find feature to help you find those lost files.

Where To Look

To access the Find feature, click the Start button, select Find, and choose one of the following: Files Or Folders, Computer, On The Internet, or People. You can also access the Find feature by right-clicking Start and selecting Explore. Then, from the Tools menu, select Find and choose one of the available options.

Files Or Folders. When you select the Files Or Folders option, the Find: All Files dialog box appears with three tabs: Name & Location, Date, and Advanced. (Alternatively, right-click the Start button and select Find to open the Find: All Files dialog box.)

In the Named field of the Name & Location tab, type part or all of the file or folder name or click the drop-down menu to select from a list of previous searches. If the name escapes you, type some text contained in the file in the Containing Text field. In the Look In field, type a location to start the search or click Browse to select a location. If you click Browse, the Browse For Folder dialog box appears with a directory tree of main folders and drives. Click the plus sign (+) next to the folder or drive to locate the folder you want to start in. You can also click the Look In drop-down menu for a list of previously searched locations. To include subfolders in the search, select the Include Subfolders option.

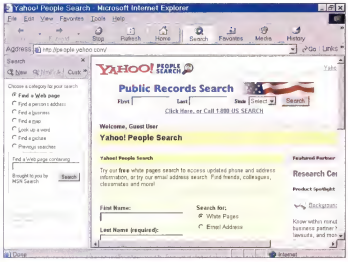
When entering your search criteria, you're only required to fill in one field, such as the Named field. In addition, you can use wildcard characters in your search criteria. Use an asterisk to replace a group of characters or the question mark to replace one character. For example, if you're searching for Word files, you can type *.doc in the Named field and the Find feature pulls all DOC files.

On the Date tab, the All Files option finds all files that match the criteria defined on the Name & Location tab, regardless of the created or modified date. To use the date as a search parameter, use the Find All Files option and select Modified, Created, or Last Accessed. Next, specify the date range. If you only have an idea of the time frame, use the During The Previous Months or During The Previous Days options.

To narrow your search even more, go to the Advanced tab. From the Of Type drop-down menu, select the type of file to search for, such as MP3 File. You can also specify the file size using the Size Is option.

To begin your search, click Find Now. The results appear in the bottom half of the dialog box, which is now named Find: Files Named. The name of the file or folder appears in the Name column, and the location of the file or folder appears under In Folder. To open a result, double-click the item, highlight the item and select Open from the File menu or right-click the item and choose Open.

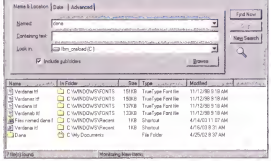
Other options available when a search result is highlighted include Send To, Create Shortcut, Properties, Open Containing Folder, and Save Search. To send the selected file or folder to another location, such as My Documents, select Send To. Select Create Shortcut and a shortcut to the file or folder is created and listed in the results window. Click and drag the shortcut to



When using a search service, such as Yahoo! People Search, to find people, click the Web Site button in the Find People dialog box to open the search service's Web site in Internet Explorer.

your Desktop. To find out such characteristics as file size, select Properties and the file or folder's Properties window appears. Use the Open Containing Folder option to see the contents of the folder that houses the selected file or folder.

To save only your search criteria, select the Save Search option and a shortcut to the search is placed on your Desktop. To save your search results along with the search criteria, select Save Results from the Options menu so that a check mark appears, then select Save Search from the File menu. A shortcut to your search, including the results, is placed on your Desktop.



The results of a Files Or Folders search appear in the bottom half of the Find All Files dialog box.

When you highlight a folder, you will see two additional options: Explore and Find. Select Explore and the contents of the selected folder appears in a separate Explorer window. To search the contents of the selected folder, select Find. If you are highlighting a file, the File menu includes a Print option for printing the file.

Computer. To find another computer on a network, select the Computer option. On the Computer Name tab of the Find Computer dialog box, type the name of the computer in the Named field. To see a list of previously searched-for computers, look in the Named drop-down menu. If you're looking for a specific shared folder on the other computer, in the Named field you can type the computer's name followed by a backslash (\) and the name of the folder (for example, editorial\articles). Click Find Now and the search results appear in the bottom half of the screen.

People. When you select the People option, the Find People dialog box appears. In the Look In drop-down menu, you can choose to search your Address Book or use a search service, such as Yahoo! People Search. If you select Address Book, on the People tab, type your search criteria and click Find Now. Your search results appear in the bottom half of the Find People dialog box.

To use a search service, you must be connected to the Internet. Once you enter your search criteria and click Find Now, the search service's Web site opens in Internet Explorer. For example, when you select Yahoo! People Search, there are two tabs: People and Advanced. On the People tab, type the name and email address of the person you're looking for. On the Advanced tab, you can define search statements using three fields. First you'll select a subject, such as Name, and then a verb, such as Starts With. In the third box, you'll type the letters or names to search for and then click Add. Click Find Now and the Yahoo! People Search Web site opens in Internet Explorer.

To go directly to the search service's Web site without defining any search criteria, click the Web Site button. The selected site opens in Internet Explorer with the Search function available on the left side of the screen.

On The Internet. The On The Internet option opens Internet Explorer with all of its search functions available on the left side of the screen. There are several search categories to choose from: Find A Web Page, Find A Person's Address, Find A Business, Find A Map, Look Up A Word, Find A Picture, and Previous Searches. A service provider, such as MSN Search, performs each type of search. To customize your search settings, click Customize. You can then use the Search Assistant to select which service provider does which types of searches, or you can use the One Search Service to select one service provider to perform all searches.

Lost & Found

Computer files and folders aren't like socks: Your files and folders don't disappear into a black hole, never to be recovered. Although you can't use the Find feature in Win98 to help you find your car keys in the morning, it can certainly help you track down that lost computer file or folder. ❚❚

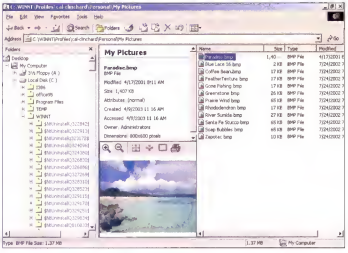
BY DANA MONTEY

A Fresh Look At Windows 2000

Windows 2000 is an extremely popular OS (operating system) in the corporate arena, sharing the spotlight with the more ubiquitous Windows NT and various Unix and Linux iterations. And yet, Win2000 enjoys a loyal following of home users, too, undoubtedly because the OS is generally stable and secure. So let's begin a two-part look at how Win2000 compares to its home-user cousins Windows 98/Me/XP to determine whether upgrading to Win2000 is right for you.

Power Base

At the heart of any OS is its **kernel**, the main part of an OS that's responsible for input/output operations, memory management, and other services essential to the OS. Win2000 and WinNT are both built on the same kernel. In fact, Win2000 is an updated version of WinNT and was originally supposed to be called WinNT version 5. But between 1997 and 1999, Microsoft's intended release dates came and went until the company finally unveiled the new OS in 2000 (thus, the name Win2000). The WinNT/2000 kernel is known for providing stable, reliable performance, which is one of the main reasons big businesses choose these OSes. Although no OS is entirely crash-proof, WinNT/2000 systems crash far less often than systems running earlier Windows versions.



Windows 2000 contains an early version of the picture viewer found in Windows Me/XP. It lets you preview, magnify, and alter images without opening them.

Win98 and WinMe are built on the same kernel, but one that's different from the WinNT/2000 kernel and is more prone to occasional crashes. However, Win98/Me are compatible with a wide range of consumer devices and are in many ways easier to use than WinNT/2000. Microsoft attempted to deliver the best of both worlds with WinXP, which is built on the WinNT/2000 core, incredibly user-friendly, and compatible with more devices.

Organization. Win2000 and WinXP also have something in common in that they both support NTFS (NT file system) in addition to the older FAT (file allocation table) and FAT32 (32-bit FAT) file systems. Microsoft recommends NTFS as opposed to FAT or FAT32 because it provides more efficient data compression, file encryption for security, better virus protection, and support for hard drives as big as 2TB (terabytes). By contrast, Win98/Me support only FAT and FAT32.

Variety. Win2000 comes in four basic flavors. Win2000 Server is designed for sizable client/server networks and Web server applications, whereas Win2000 Advanced Server and Win2000 Datacenter Server are best for larger enterprise networks. We'll focus on Win2000 Professional, which is designed for use on network workstations, as well as on standalone desktop and notebook PCs.

The Fabric Of Our Lives

OK, 100% cotton it isn't, but Win2000 has a definite look and feel. For most users, Win2000 truly is the fabric of their daily lives because the OS runs on their office network and there's no escaping it. However, some of us have a choice as to what OS to use, and Win2000 offers some solid benefits to many home users.

Looks. Judging by appearances alone, Win2000, with its consistent Start menu and minimal set of Desktop backgrounds and screen savers, is not much different from Win98/Me. To personalize the look of a Win2000 computer, you can add your own pictures, buy or download screen savers, or install special software. One improvement that WinMe/2000/XP share is that you can use many different image types (BMP [bit-mapped], GIF [Graphics Interchange Format], and JPEG [Joint Photographic Experts Group] files) for your Desktop; with Win98, you can only use BMP files.

Win2000 lets you manually drag program shortcut icons (such as the icon you would normally click to launch Internet Explorer) onto the upper portion of the Start menu for quick, easy access in the future. This is a handy feature, but WinXP builds on it a little so that the programs you most frequently use are automatically added to the bottom portion of the WinXP Start menu.

Navigation. You can access Windows Explorer the same way in every Windows OS starting with Windows 95: right-click the Start button and select Explore. You can set file folder options, store personal documents in My Documents and My Pictures folders, and view your Web browsing history in Win2000 the same as you can in Win98/Me/XP.

In Win2000's Windows Explorer, Microsoft introduced an advanced search feature that's virtually identical to the one in WinMe. It has expanded search options to help track down a file by date, type, size, location, and other criteria. It's easier to use than the search features found in Win98/NT and is a precursor to the interactive, browser-like WinXP search feature.

Compatibility. Although Win98/Me are known for supporting a wide variety of consumer hardware, Win2000 actually sports a longer list of compatible devices. WinXP is quickly catching up, but Win2000 still takes the top spot for compatibility with the broadest range of hardware. If you have a Win98 system and are accustomed to installing drivers with new hardware, you'll find that Win2000 supports far more devices without requiring that you install a special driver.

Control. If you want the best available control over the files and folders on your computer, you'll prefer Win2000/XP over Win98/Me. Open Windows Explorer in Win98/Me, right-click a file or folder, and select Properties and the only attribute choices available are Read Only, Hidden, and Archive. If you follow the same procedure in Win2000/XP, you'll find many more options, including a compression feature to help free up disk space, as well as access permission settings to control what other users on the PC or a network are permitted to do with a file or folder.

Imaging. The Windows Explorer that comes with Win2000 offers some improvement over that in Win98 because it lets you see a thumbnail view of files in a given folder. Win2000 has an early version of the Image Preview program that comes with WinMe and the Windows Picture And Fax Viewer that comes with WinXP; these programs let you preview and print images without having to open them first. Like WinMe (but not Win98), Win2000 includes Kodak's Imaging For Windows program, which lets you perform basic editing tasks.

Entertainment. Although you can add all kinds of multimedia devices and software to a PC running Win2000, it doesn't come with anything more than Win98 did: Microsoft's CD Player program and Windows Media Player version 6.4. You can use these programs to listen to streaming audio from the Internet or an audio CD in your system's CD drive and view streaming video. But in terms of features, these programs offer only the bare essentials compared with recent Windows Media Player versions. So far the only Windows OS to include built-in CD-burning (recording) capabilities is WinXP.

Tune In Next Month

As you might expect, there's far more to the basics of Win2000 than we can cover in two pages. Look for part two of this article in next month's issue, wherein we'll take a closer look at Win2000's networking features and system utilities. ❚

BY CAL CLINCHARD

Windows 2000 Vital Statistics

Officially launched on Feb. 17, 2000, Win2000 Professional is still available through the Shop Microsoft Web site (http://shop.microsoft.com) for $319. An upgrade version is available for $219 if you're upgrading from Windows 95/98, or $149 if you're upgrading from Windows NT. Most computers you can buy today will run Win2000 Pro with no trouble, but if you have an older system, you should make sure it meets the operating system's minimum system requirements:

- 133MHz Pentium-compatible CPU
- 4MB RAM
- 2GB hard drive
- 650MB available hard drive space
- CD or DVD drive
- Monitor with a 640 x 480 or higher resolution

To find out what specific hardware devices are compatible with Win2000, visit Microsoft's Win2000 home page (http://www.microsoft.com/windows2000) and click the Windows 2000 Professional link. Under Quick Links, click the Compatibility link and follow the instructions on the Web page to search for specific devices. ❚

Looking for the best digital photos?
Follow the leader.

YOU'VE GOT TO SEE IT IN EPSON COLOR.™

Print your photos from memory cards* or any Direct-Connect-Compatible (DCC™) digital camera. Then save them directly to an external USB Zip drive – all without a computer.

View pictures, layouts and cropping options without a computer screen using the optional Color Preview Monitor ($79).

Crop, resize and select from various BorderFree™ templates (4x6, 5x7, 8x10) using the control panel. Then, save your favorite settings and recall them with Epson's exclusive One Touch button feature.

Leave the printer unattended while it prints and trims your photos automatically, using an exclusive built-in cutter and attachable roll paper holder. (Cutter with Stylus Photo 925 only.)

Get brighter colors, sharper detail and the most lifelike skin tones from a superior 6-color Photo Ink system with true black, 4-picoliter droplets and up to 5760 x 720 optimized dpi.

Ensure the quality of your prints with Epson's PRINT Image Matching™ (P.I.M.) technology – which makes automatic color corrections and adjustments when used with any P.I.M.-enabled digital camera.

Prices starting at $149

Epson Stylus Photo 825 Epson Stylus Photo 925

Why do so many digital camera owners look to Epson for all their printing needs? Because only Epson makes photo printers designed to work specifically with digital cameras. For images with more color and detail than ever before. Which means now the image quality that could only be found in a professional photo lab is yours to create – right at home. As you can see, when it comes to digital pictures, no other photo printer comes close to giving you the quality and convenience you get with this printer. For more info, call 1-800-GO-EPSON or visit epson.com.

*Supports Compact Flash type I and II, Memory Stick, Smart Media, Secured Digital, MultiMedia and Microdrive (optional adapter needed for Compact Flash type II and Microdrive on SP 825, optional Zip Reader needed for Secured Digital and MultiMedia on SP 9/8). Epson, Epson Stylus and PRINT Image Matching are trademarks/registered trademarks of Seiko Epson Corp. BorderFree is a trademark of Epson America Inc. All other trademarks are properties of their respective companies. © 2003 Epson America, Inc./© Tim Hawley

Smart Move Or Terrible Mistake?

Should You Build Or Buy Your Next Computer?

SOME IDEAS are just so incredibly bad that the people responsible for coming up with them really should have known better. Need examples? Remember the Chevy Vega? Microsoft Bob? Neil Diamond?

On the other hand, some ideas are obvious winners from the get-go: The Apple IIe. The Internet. The 1955 Ford T-Bird. The iMac. Hershey bars with almonds.

Here's another good idea: Build your own computer. But is building your own computer really a wise choice? As with everything else in the world of computers, it depends. For some people, it's a smart move: a productive way to learn more about the technology, save some serious money, and gain the satisfaction that comes from having accomplished a truly impressive task. For others, it may turn out to be a lot of effort without much gain.

Which is it in your case? Let's find out.

Skills & Tools Required

The first thing to consider is whether you have the skills required. It's not really a demanding task; there's normally no need to solder, follow schematics, or use a volt-ohmmeter. Even if you loafed during your electric shop course, you can still pull this off. And although you may need to install a circuit board (your motherboard), actually *assembling* such a board is not required.

You'll need to use some tools, of course: flat-bladed and Philips-head screwdrivers and perhaps a pair of needle-nose pliers. A small socket set or nut driver is handy for taking the sides off of cases and tightening items such as video or sound cards when mounting them in a PCI (Peripheral Component Interconnect) slot.

You'll need one tool that's easy to overlook: an antistatic wristband or mat. It's very easy to build up enough of a static charge to completely fry your $100 motherboard or your $300 CPU. Use the wristband or mat to safely discharge that static electricity before you handle sensitive electronic parts. (You don't even want to hear about how we learned this. It's much too depressing.)

The only other skill you'll need is the ability to follow instructions. Most of the parts you'll purchase for this will come with fairly decent installation instructions, and you'll want to follow them very closely. In addition, you might want to check out the June 2002 "Build A PC" issue of *Smart Computing*. If you're a subscriber, it's available [as are all previous issues] at http://www.smartcomputing.com.)

Parts Required

A computer is a system, a collection of parts that must work together perfectly in order to accomplish anything. Still, as complex as such systems seem, there really aren't all that many parts to worry about. Generally, you'll need the following: a case (which often comes with a power supply and fan), a main circuit board (often called a mainboard or motherboard), a CPU (normally with its own heatsink and fan), memory, a hard drive, a CD-ROM, video and sound cards (unless you intend to use the video and audio components built into the motherboard), and an extra fan or two. Of course, you'll want a monitor, keyboard, mouse, and possibly a floppy diskette drive, some or all of which you may already have.

Not too terrifying, is it? Basically, you're looking at 10 to 12 parts and some cables to connect them; not nearly as complicated as that carburetor you once took apart, is it? (You did get it put back together, right?)

So, Should You Bother?

Now that you have a better understanding of what such a project might require, let's get back to the question at hand: Is it worth your while to build your own computer?

The answer will depend largely on *why* you want to do so. Is it to save money? To learn more about the technology? To ensure that your computer is built exactly as you want it? Simply for the satisfaction of having done it?

Intel's George Alfs says those are all great reasons. "If you are willing to spend the time, you can build a very nice system for possibly less money," he says. "And once you build a system, you know how to update and repair it, and computers will be less mystifying."

But can you really save any money? Take another look at the parts list. If we estimate the costs of those parts, we'll see that if we opt to use the video and audio that are integrated into the motherboard, our build-it-yourself computer will cost us somewhere in the neighborhood of $600 to $700. If we decide not to use the integrated audio and video, add another $130 or so for separate sound and video cards.

Not too bad, really. You end up with a pretty fast, powerful machine for maybe $800. Not to mention the bragging rights for having done it yourself.

The potential downside. The upside is pretty obvious, but what do you stand to lose? Well, support, for one thing. "If you build a computer and your video card doesn't work with your sound card, it's up to you, the Internet, or the manufacturer's phone support representative to work through the issue," notes Crucial Technology's Erin Duckhorn. "When you buy a complete system, you have one point of contact for support and replacement parts."

Support becomes an especially troubling issue if you purchase unmatched parts from several places. When your hard drive starts giving you trouble, whom will you call? And what if the hard drive problem is actually being caused by the motherboard or some other component? Similarly, if your memory begins to flake out on you, will you know whether the problem is really the memory, as opposed to the power supply or the motherboard? And, if so, will you be able to convince the appropriate vendor that its device is the one causing the problem?

Consider the alternative. Let's compare our $800 homemade system to a readily available OTS (off-the-shelf) computer. At press time, the Sony VAIO PCV-RS210 was available at retail stores and on the Web for roughly $850. It included a 2.4GHz Pentium 4 processor, CD-RW (CD-rewriteable) and DVD-ROM drives, 512MB of RAM, an 80GB hard drive, plus integrated audio and video, all for about the same price as our home-built system. In addition, the Sony includes a one-year parts and labor warranty, an operating system (Windows XP Home Edition), Corel Office Suite, and a number of other applications.

Hmmm . . . Same money, essentially the same computer, but in a nicer case. Plus a warranty and software. Maybe we should give this a little more thought.

This is not an isolated example. Naturally, you can pay a little less or a lot more for an OTS computer, but you can almost always find a machine comparable to one you might build for about the same amount of money as you'd spend on parts. At press time, Hewlett-Packard was offering the HP 504n with a 2.0GHz Celeron processor, 256MB of RAM, and a 40GB hard drive for $470. An online etailer was selling a 2.66GHz Compaq Presario for $1,050, and an eMachines T2245 with a 2.2GHz Celeron CPU, 256MB of RAM, and a 40GB hard drive for $500. That's a pretty broad range of systems, and they all cost about the same as you'd have to pay for the various components.

For less than $500, this HP 504n system includes a 2.0GHz Celeron processor, 256MB of RAM, and a 40GB hard drive, but no monitor.

The bottom line is . . . well, the bottom line. How much money would you like to lay out? Can you spend about the same (or even less) and get a computer that's just as good, if not better, than what you could build?

Yes, It Can Be A Good Idea

Does this mean that you should forget about building your own computer? Not necessarily. As Duckhorn says, "Building a computer is a great project for someone who wants to know more or for people who know exactly what their requirements are."

It can also be a smart move if you happen to have unused computer parts sitting in a closet at home. Have a decent hard drive or CD-ROM drive scavenged from a computer that died? You just saved $50 to $75. A working and up-to-date CPU that your cousin sent you when he visited Taiwan? There's another $100 or so. Throw in a case and power supply from that computer your boss tossed in the dumpster last month and you just shaved $200 or so off the cost of a new machine.

Again, it comes down to *why* you're thinking of building a computer. If it's because you like tinkering, enjoy the challenge, or have some spare parts you need to put to use, building your own system may be a wise move. If it's strictly to save money, take another look at the OTS machines before you head down that path. You don't want to end up building the digital equivalent of a Chevy Vega. ■

BY ROD SCHER

Compiled by Nathan Chandler
Graphics & Design by Andria Schultz & Ginger Riley

Traditional Cake Makes An About Face

Cake decorating is a long-lived art form, and the best creators have a knack for adding ornate floral patterns and delicate swirls that make you think twice before sinking a fork into the icing. Most of us don't have those kinds of cake-making skills, but there are ways for everyone to indulge in cake confectionery's newest trend: image cakes.

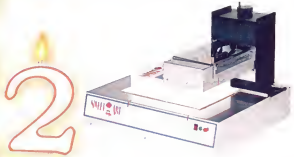
Image cakes can bear just about any graphic you want, and there are a couple of ways those images can be moved from film to frosting: One uses a pricey machine to paint directly onto the cake, and another lets you stay at home and use your inkjet printer to print an icing sheet that rests on the cake's top layer.

Industrial Strength: The Jet Decorator

Sweet Art (http://www.sweetart.com), based just outside of Kansas City, Kan., in Olathe, Kan., was the first to create a machine, called the Jet Decorator, that sprays images directly onto a cake or cookie surface. The system was designed for high-volume bakeries and costs $5,499.

1

The designer scans a photo into the computer, where he crops the photo and alters it to a resolution of about 100dpi (dots per inch). Using Sweet Art's proprietary software, the designer lays out the cake with the desired text and accompanying clip art (or other) images.



2

The designer clicks Decorate, and the Jet Decorator's food coloring gun, which moves laterally across the cake, begins spraying with its nozzle about 1/8-inch from the cake's surface. The printhead uses the concepts of a basic inkjet printer to warm the food coloring and apply the coloring accurately. But instead of feeding paper through a printer, the Jet Decorator's arm moves the printer over the cake, letting you color a 3D object that would be impossible to feed through a printer.

3

About seven to eight minutes later, the Decorator completes the image and the decorating is complete. Jet Decorator cakes generally sell for about $20.

Do It Yourself: Sheet-based Systems

A number of companies sell more affordable systems that use an off-the-shelf or slightly modified inkjet to print food coloring onto a starchy sheet with an adhesive backing.

1

Use the included software to lay out your cake or cookie design.

2

Insert an edible, starchy sheet, often made from potatoes or rice, into the tray of a regular inkjet printer; Canon inkjets are a favorite with icing industry pundits because they have a relatively straight paper feed compared to other printer brands. The printer uses specially designed cartridges that contain edible ink, usually in food-grade plastic containers. As with any other print job, the printer sprays droplets of the ink onto the wafer in precise patterns that provide excellent details in photographs. (The printer shown here is a slightly modified Canon inkjet designed for heavy use.)

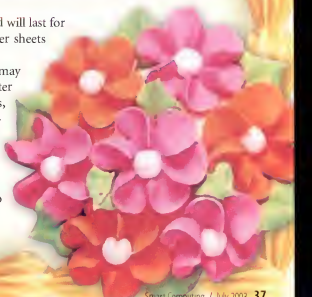
3

Carefully take the printed wafer, which now has a nongooey, plastic-like surface, remove the backing, and place the food-coloring image on your prebaked and prefrosted cake. Touch up your decorating and enjoy!

The sheet-based systems sold by Sweet Art and other companies may actually provide slightly better image quality than the Jet Decorator. On the downside, some cake aficionados believe the wafer doesn't really absorb fully into the cake, leaving a foreign layer that resists the fork a little.

Several online companies, such as Sweet Art and Edible Imaging Systems (http://www.icingimages.com), sell complete sheet-based systems. Edible Imaging Systems sells a $550 entry-level system with everything you need to get started. Replacement color and black ink cartridges sell for $50 and will last for 60 to 80 cakes, and the wafer sheets are about $1 each.

Have an inkjet already? It may be possible to use your printer to create image-cake sheets, but due to potential problems with toxicity, we don't recommend switching back and forth from ink to food coloring. Instead, buy a new printer and use it only to make cake toppers. ■



The Digital Carry-On

Take Your Data On The Road

If you use your PC regularly, you probably have large quantities of documents, photos, videos, and other data on your computer's hard drive. Internal hard drives are ideal storage devices because they are large and you can access the stored data quickly: Just power on your computer and you can browse the hard drive's contents. The downside is that internal hard drives aren't very portable, and it isn't always easy to transfer data from a hard drive to another device.

Whether you need to take files with you when you travel or you simply want to transfer data to another computer in your home, you'll need an additional device (or devices) to complete the transfer. The Internet is not always the fastest (or most secure) way to transfer data, especially if you connect via a dial-up modem. If you plan to shuffle data among computers in your home or small office, you can build a network, but keep in mind that you'll need to buy networking equipment. And although the Internet and other networks may let you transfer data between connected devices, they can't reach unconnected devices. If Grandma refuses to connect to the Internet, you won't be able to put your digital photo collection on her computer without portable media. And if Grandma's computer doesn't accept that media, you'll need a portable storage device.

Portable storage devices become popular and then outdated rapidly as manufacturers discover better ways to tote digital belongings. As with floppy diskettes, which have a much smaller capacity than other popular media, some outdated portable storage devices are still useful in certain circumstances. When you shop for a portable storage device, consider the device's capacity, size, and connection. If you plan to use a device that connects to USB (Universal Serial Bus) ports, make sure all of the computers you use have USB ports. Some devices, such as Zip drives and CD-R (CD-recordable) drives, require additional media, which you should keep in mind when you estimate the device's overall cost.

Floppy Drive

External floppy drives are the underdogs of the portable storage arena. Floppies, also known as 3.5-inch diskettes, store only 1.44MB. Most programs are larger than 1.44MB, as are many files. But the floppy drive lives on because the drive and its media are cheap and rewriteable. If you need to work on a document in class, you can save the document from your computer to a floppy, open and edit the document on the school computer, then save it again on the floppy. Floppies are inexpensive, so if you lose a floppy while in transit, you'll probably regret losing the data more than the floppy.

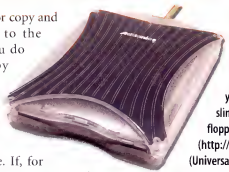
You can buy an internal floppy drive for less than $15, and floppies are cheaper than CD-Rs. Internal floppy drives are easy to install and less expensive than external drives, so if you plan to take floppies to Grandma's house often, you might as well install a drive. In some cases, you won't be able to install an internal drive. Many notebooks don't have floppy drives, and some super-slim computers forgo them, as well. Most new external floppy drives connect to the computer via USB, but you may be able to find drives that connect via parallel ports in retailers that sell old computer parts.

Zip Drive

What can you do if you don't want to grapple with CD software and fragile discs, but you need to transfer files that are larger than the standard floppy 1.44MB capacity? Zip drives fill the gap between floppy drives and CD burners. Although many companies manufacture Zip drive media, Iomega (http://www.iomega.com) is the only company that offers the Zip drive.

The Zip disk looks and acts like a large floppy. Once you install the Zip drive, you can access it from your My Computer folder. To save a file to a Zip disk, you insert the disk and then

drag and drop (or copy and paste) the file to the disk, just as you do with the floppy drive. If you back up files regularly, you'll enjoy having the extra storage space. If, for example, you use Microsoft Money, you probably back up your entire Money file to a floppy every few days. The backup file grows as you input information, and eventually the file will require more than one floppy. If you want to keep your backup file on a single disk, you can redirect the file to the Zip drive.



Although floppy drives are outdated, most computer manufacturers put continue to include them in desktop PCs. If you have a notebook or a slim desktop, add an external floppy drive, such as Addonics' (http://www.addonics.com) USB (Universal Serial Bus) Floppy Drive.

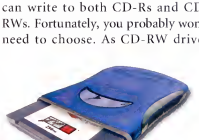
Iomega offers three Zip disk capacities: 100MB, 250MB, and 750MB. It also offers three types of drives. The 100MB drive accepts only 100MB disks, the 250MB drive accepts 100MB and 250MB disks, and the 750MB drive can read data from all three types of disks but can only write to the 250MB and 750MB disks.

External Zip drives are about the size of a hardcover book, which means you can toss (well, maybe place) the drive into an overnight bag or suitcase. Iomega's IomegaWare software lets you install the drive on several operating systems. You can attach the Zip drive to your computer, download files to a Zip disk, and then connect the drive to a different computer to load the files. The drives range from $99.99 for a 100MB drive to $199.99 for a 750MB drive. Iomega offers Zip drives with several types of connections, including USB, FireWire, SCSI (Small Computer System Interface), and parallel port. Make sure that your computers have ports that match the drive's connection.

CD/DVD Drives

CD-RW (CD-rewriteable) drives are popular storage devices because CDs have high storage capacities (generally 650MB to 700MB) and because most computers have CD drives. If you have a CD drive in one of your home computers, you can use the CD to load data onto your other computers without attaching an additional drive. However, portable CD-RW drives are handy when you need to store data from a computer that doesn't have a CD-RW drive. Although most current notebook computers include a CD drive, many do not have a CD-RW drive.

CD-R drives can write data to a CD-R more than once but cannot write over data already on the CD. CD-RW drives let you write over data (on the CD-RW), just as you can with floppy and Zip drives. CD-RW drives can write to both CD-Rs and CD-RWs. Fortunately, you probably won't need to choose. As CD-RW drives dropped their once-heavy price tags, CD-R drives took a firm step toward obsolescence. Most retailers sell only CD-RW drives. When you buy media, you'll find that CD-Rs are much less expensive than CD-RWs. If you want to back up a file to the CD routinely, use a CD-RW. If you plan to write to the CD only once, you can save money by using CD-Rs.



Zip drives are similar to floppy drives, but they store more data on each disk.

Although external CD drives are very portable (they are generally about the same size as Zip drives), some are slower than internal CD writers. When you find a CD writer in your price range, check its speeds. All manufacturers use the same format to indicate read and write speeds. For example, a 48x/16x/48x CD-RW drive writes data to the CD at 48x, rewrites at 16x, and reads at 48x. The *x* refers to speed. The higher the number, the faster the transfer speed.

DVD-R and DVD-RW drives are expensive storage options. DVDs can hold more data than CDs (as much as 4.7GB) but DVDs cost more than CDs. If you need to write DVD files to media that can play DVDs, you'll need a DVD writer. Otherwise, you're better off using other devices to store large amounts of data.

Most DVD-RWs and CD-RWs require a FireWire or USB 2.0 connection (if your computer has USB 1.1 ports, the drive will perform significantly slower). USB 2.0 is new and not as common as USB 1.1 yet, so make sure that your computer has FireWire or USB 2.0 ports before investing in a DVD writer. If your computer does not have the right ports, you can buy PCI (Peripheral Component

Storage In Cyberspace

If you want to travel light, invest in online storage space. Many Web-savvy companies now offer portions of their servers to Internet users (for a monthly fee). This isn't the fastest way to transfer data (you can only transfer as fast as your modem allows), but its main feature is distance rather than speed. If you back up your data to the Internet, you won't lose it in a disaster, such as a house fire.

If you don't feel comfortable flinging sensitive data across the Internet, stick with the tried and true external devices and keep a backup copy at a different location. ▮

Interconnect) cards that include FireWire or USB 2.0 ports. The PCI card connects to the motherboard and lets the ports protrude from the back of the computer. Although there are few DVD writers currently in the marketplace, manufacturers will probably produce more when FireWire and USB 2.0 ports are more common in mainstream PCs.

Flash Drive

If you're looking for a storage device that you can slip into your pocket, consider a Flash drive. Flash drives, also known as nonvolatile memory drives, don't write data to media, which means you won't have to carry multiple floppies, CDs, or media cards when you travel. Most drives are not expandable, but new Flash drives often include expansion ports that let you connect additional memory chips.

One of the Flash drive's most important features is its size. Because Flash drives don't need to house moving disks, they are small. If you are planning to travel with your storage device, you'll like the small clip at the end of some Flash drives that lets you attach the drive to your key chain.

Flash drives are small and transfer data quickly through your computer's USB (Universal Serial Bus) port.

Most Flash drives connect to your computer via the USB port. Before you shop for Flash drives, make sure you know whether your computer's USB ports are USB 1.1 or USB 2.0. As with other USB devices, a USB 2.0 Flash drive is compatible with a USB 1.1 port on your computer, but the drive will only run at the port's highest speed. Like FireWire, you can add USB 2.0 ports to your computer by installing a PCI card. Once you connect the Flash drive to the computer, an icon and drive letter appear in your My Computer folder. You can drag and drop files between your computer and the Flash drive just as you do with other folders on your PC.

Unlike external Zip drives, CD-RWs, and DVD-RWs, Flash drives draw power from the computer, which means you won't need an external power supply. Many Flash drives don't require drivers for computers running Windows Me or later. Inexpensive Flash drives hold as little as 16MB; high-end drives top out at around 1GB.

External CD-RWs (CD-rewriteables), such as the MicroSolutions Backpack CD-RW/DVD-ROM, let you store your data on inexpensive media.

Hard Drive

Sometimes 1GB just isn't enough. Software publishers often spread large program installation files over multiple CDs. If you want to put 75GB of digital home video onto Grandma's PC, you won't be able to store it on a tiny USB Flash drive, and you probably don't have the patience (or the time) to break the video files down and write them onto roughly 107 CDs. If you find yourself wishing you could just yank your hard drive out of your PC and throw it into your suitcase, you're in luck. External hard drives have large storage capacities. You can't transfer information between an external hard drive and your computer as fast as you can with an internal hard drive, but if you need portability and capacity more than speed, consider an external hard drive.

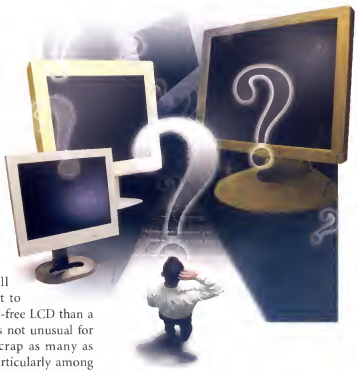
Although you can carry an external hard drive just as easily as an external CD-RW (the hard drive is roughly the same size and only a little heavier), you may want to use it to expand your PC's overall storage capacity. Installing a second internal hard drive is tricky, so if you rarely venture inside your PC, you are better off upgrading your computer by attaching an external hard drive.

Whenever possible, store files, instead of programs, on the external hard drive. Applications won't perform up to par if they have to negotiate slow connections. Try to keep your programs on your internal hard drive, where they will be able to communicate quickly with your computer. Some devices have more than one connection type. For example, MicroSolutions (http://www.micro-solutions.com), which manufactures the Backpack Portable Hard Drive, placed two connections on the 80GB tote: a parallel cable and a USB cable. If you need to connect to a computer that doesn't have any USB ports, you can transfer data to the computer through the parallel port (the same port that older printers use) at, according to MicroSolutions, up to 1.2MBps (megabytes per second). MicroSolutions claims the USB 2.0 cable can transfer data to USB 1.1 ports at 1MBps and to USB 2.0 ports at up 25MBps.

Take the time to make sure all of your computers (and any other computers to which you plan to connect the storage device) have the appropriate ports. Although you can usually add ports to desktop systems without much trouble, you can't add ports to most notebooks. You should also be certain that the drive (or its media) is large enough for current and future files. ■

BY JOSHUA GULICK

The Ultimate Flat-Panel LCD Buyer's Guide: Part 1



THIS TWO-PART ARTICLE will tell you everything you need to know about buying a flat-panel LCD (liquid-crystal display), including some important things sellers don't want you to know. You will learn why an LCD is the most unusual technology purchase you will ever make. You will also learn how to evaluate LCDs, what to consider when deciding where to make your purchase, how to avoid buying unnecessary extras, and how to test your new purchase for defects.

If you don't already own one, chances are a flat panel LCD monitor is high on your wish list. These bright beauties, once the exclusive domain of notebooks, are rapidly taking over the desktop. LCDs have the following advantages over traditional CRT (cathode-ray tube) monitors: They require less space, are much lighter (a 20-inch CRT [19-inch viewable area] weighs in at a hernia-inducing 50 pounds, whereas a 19-inch LCD monitor weighs a svelte 13 pounds), consume about 70% less energy and throw off less heat than CRTs, and produce an undistorted, bright flat display.

Until recently, LCDs were much more expensive than CRTs, making it difficult to cost-justify replacing a CRT with the same size LCD. However, improvements in the LCD manufacturing process have resulted in higher yields, which has narrowed the price difference between these two technologies. This is particularly true for the smaller 15- and 17-inch LCD panels.

A Most Unusual Purchase

Although yields have improved significantly, it is still much more difficult to manufacture a defect-free LCD than a defect-free CRT. It is not unusual for manufacturers to scrap as many as 40% of all LCDs, particularly among the larger-sized panels. This explains why a 19-inch LCD is so much more expensive than a 17-inch panel.

Furthermore, the nature of the LCD manufacturing process is such that defects can't be discovered until manufacturing is complete. This means that all of the manufacturing costs have been built into the product before it is scrapped. When you purchase an LCD, you are not just paying for the unit you take home, but for a portion of all the other units that were scrapped, a very unusual situation.

An LCD is also the most unusual technology product you will ever purchase in that every panel sold is guaranteed to have defects. It would be cost prohibitive for manufacturers to sell only perfect units because they would have to scrap 99.9% of the units made. In many cases, the defects are not noticeable to the naked eye. But the fact remains that you are more likely to return an LCD due to product defects than any other electronic product you ever purchase. This means that you must pay *very* special attention to the manufacturer's definition of "defective," as well as the seller's return policy when you purchase an LCD.

Understand LCD Defects

LCD defects are bad pixels, or, more accurately, bad subpixels. A pixel is the second smallest unit of display on a monitor. Each pixel consists of three subpixels—a red, blue, and green one. For example, if you have an LCD that has a resolution of 1,024 x 768, the monitor actually has 2,359,296 subpixels (1,024 x 768 x 3). The three subpixels work together to display the full range of colors required for a realistic image.

A separate transistor called a TFT (thin film transistor) controls each subpixel. A malfunctioning TFT causes a defective subpixel. For convenience and simplicity, throughout the rest of this article, we will use the term "pixel," although we are really referring to subpixels. (This is common practice.)

There are two types of defective pixels: lit pixels, also called stuck pixels, and dead pixels, also known as burnt pixels.

A **lit pixel** is a TFT stuck in the on position. If one TFT is stuck, you will see a little spot of red, blue, or green on your screen that never changes. If two or more adjacent subpixels are lit (stuck), you will see a pink, yellow, cyan, or white spot on the screen.

A **dead pixel**, manifested as a dark spot on your screen, is a TFT stuck in the off position. A single defective pixel (lit or dead) is hard to spot with the naked eye. However, a cluster of defective pixels, particularly dead pixels, is easily visible and can be quite annoying, especially if they appear near the center of the screen.

Bad pixels generally cannot be repaired. Although it is possible for the manufacturer to use a laser to turn off a stuck pixel, this process just converts it into a dead pixel. In some cases, you might be able to gently rub the screen to massage a dead pixel back to life, but be careful not to damage the panel.

Dead pixels tend to be more obvious and annoying than stuck pixels, and you are more likely to want to return an LCD because of dead pixels.

Pixel Defect Policies

If you purchase an LCD that has what you consider to be an unacceptable number of bad pixels, you will want to return it. Unfortunately, you may not be able to do so without paying a restocking fee because *your* definition of "defective" maybe different from the manufacturer's definition.

Each manufacturer has its own pixel defect policy. For example, Envision Monitors, a California-based company, has a very customer-friendly pixel policy that allows four burnt pixels per screen, regardless of the screen size. If you have more than four burnt pixels, you can return the unit.

ViewSonic's pixel policy varies with the size of the screen. ViewSonic allows as many as four bad pixels (lit or dead) on a 14- or 15-inch monitor, seven bad pixels on 17- to 19-inch monitors, and 10 bad pixels on 20-inch and larger monitors. ViewSonic is careful to use the term "subpixels" to make it clear that these standards apply to the number of defective subpixels. Some other vendors are vague about this distinction, so you may need to contact the company for clarification.

Some manufacturers have more complex pixel policies, taking into consideration the number of adjacent pairs of bad pixels it will allow; the number of red, blue, or green stuck pixels it will allow (green pixels are more visible than red or blue stuck pixels); the distance between defects; and the number of defects within a circle of a prescribed diameter. Is it any wonder that your definition of "defective" might be different from that of the manufacturer?

Some pixel policies are a bit vague: NEC/Mitsubishi allows as many as 10 dead pixels per panel but may allow fewer if they are clustered together.

No matter what the policy, when you think about it, the allowed defect rate is extremely small. For example, seven bad subpixels on a 19-inch display having a 1,280 x 1,024 resolution equates to a 0.00018 % defect rate. The problem generally arises when the defects are clustered together, making them more noticeable.

Evaluation Criteria

Evaluating LCDs is a somewhat subjective exercise. Although there are objective criteria that you can use to compare units, it ultimately comes down to two things: which criteria are most important to you and which monitor looks best to your eyes.

Let's start by understanding the objective criteria. Of the following, we rate contrast ratio, brightness, response time, and warranty as the four most important criteria. However, depending on your needs, you may view things differently (pun intended).

Contrast ratio. Contrast ratio is a way of measuring the difference between the lightest and darkest areas of the display. The higher the number, the better. Contrast ratios range from 250:1 in a low-end LCD to 600:1 in a high-end unit. Getting back to the point we made earlier, that LCD evaluation is a somewhat subjective exercise, we have seen LCDs with a contrast ratio of 450:1 that look better to us than LCDs with a 600:1 ratio.

This video card supports analog and digital output. The attached LCD supports digital (white plug) and analog (blue plug) input.

Pixel pitch. This refers to the spacing between pixels on the monitor. The smaller the number, the sharper the display.

Resolution. Unlike traditional CRT monitors, which look perfectly fine at a number of different resolutions, LCD monitors only look good at one optimum resolution, known as the native resolution. The native resolution is a function of panel size and pixel pitch. Most 15- to 17-inch panels have a 1,024 x 768 native resolution, whereas a 19-inch panel typically has a 1,280 x 1,024 native resolution. Larger panels may go up to 1,600 x 1,200. The higher the resolution, the more information you will be able to view on your screen.

This brings us to a significant problem in evaluating LCDs: panels are not always displayed at the native resolution in retail stores. We saw a ViewSonic LCD on display that looked absolutely terrible because it was not set at its native resolution. This is a common problem because stores often display many monitors of different sizes together, hooked up to one PC. Unless every monitor in the display has the same native resolution, some of the monitors will look quite bad. A retailer can use this fact to make the smaller, lower priced monitors look worse than the larger, more expensive monitors, thereby enticing you to spend more money.

Size. LCD monitors are not measured the same as traditional CRT monitors. Although both are measured on the diagonal, the LCD diagonal measurement is a true one, whereas the CRT diagonal measurement has traditionally (in the United States) been a nominal measurement. For example, a 19.1-inch LCD has the same diagonal as a 20- inch CRT, so don't make the mistake of buying a larger and more expensive LCD monitor than you need.

Bigger is not necessarily better in the world of LCDs. Smaller LCDs tend to have sharper pictures than larger panels because manufacturers tend to use a bigger pixel pitch in larger panels to keep costs down.

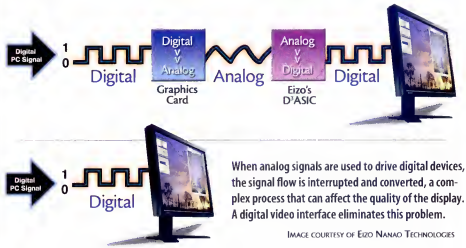
Viewing angle. The viewing angle defines how clear the image is when viewed from different horizontal and vertical angles. If you are the sole user of the computer, you needn't be concerned about the viewing angle. The best LCDs have a viewing angle of 170 degrees. This means that anyone viewing the screen up to 85 degrees (half of 170) in any direction from the center will be able to see a clear image.

Brightness. Brightness is measured in candelas per square meter. The higher the number, the better the display will look under adverse lighting conditions. A good number is 250 candelas per square meter.

Interface. Some LCD monitors let you connect to your computer via a digital interface. To use a digital interface, you will also need a video card in your computer that supports digital output. In theory a digital interface provides a higher quality image than an analog interface. In practice, many have difficulty perceiving a difference.

Response time. This refers to the amount of time it takes a pixel to change. LCDs have slower response times than CRTs, which means that LCDs are more subject to ghost images. This is particularly important if you are using your LCD to watch movies or play computer games. Better LCDs have a response time of 25 milliseconds or less. If you have demanding requirements in this regard, you are better off with a CRT monitor than an LCD display.

Controls. All monitors have on-screen controls for controlling brightness, contrast, and other characteristics. Some have an auto-adjust feature that takes the guesswork out of adjustments.



When analog signals are used to drive digital devices, the signal flow is interrupted and converted, a complex process that can affect the quality of the display. A digital video interface eliminates this problem.

IMAGE COURTESY OF EIZO NANAO TECHNOLOGIES

Aesthetics. A unit with a narrow screen bezel will require less space on the desktop.

Special features. Some LCDs can be manually pivoted 90 degrees and use pivot software to let you view the image vertically. This requires less scrolling when surfing the Web or working with certain types of documents.

Warranty. Be sure to buy a unit that has a three-year parts and labor warranty, and be certain that the three-year parts warranty includes the backlight, the source of illumination for the display. The backlight is the LCD component that is most prone to failure over time, and some manufacturers provide a shorter warranty for this component.

In part 2 of this article, we will discuss how to subjectively evaluate LCDs, where to make your purchase, how to avoid a very costly unnecessary extra, and how to test your new purchase for defects. ■

BY ALAN LUBER

The Wheel Deal

Use This Guide To Find The Best Auto Deals Online

WEB-BASED RETAILERS are a godsend for super-store burnouts and weary mall walkers, and these days, there are a number of sites promising to help shoppers with the one purchasing process that many people hate most: buying a car. Nearly two-thirds of new car buyers use the Web to research vehicles, and more are logging on every day.

You can use the power of the Web's research tools to find information on trade-in values, used-car pricing, new car reviews, and vehicle reliability. You may also find new and used cars for sale from dealerships and private parties all over the country, locate the best financing and insurance rates, or post an ad for your own used car.

It's handy to access so much auto-related information through your PC, far from fast-talking car salespeople. Comfortable as this process may be, don't the let the supposed anonymity of Web-based shopping weaken your financial vigilance as you search for what is probably the second biggest purchase in your life. We'll show you how to enjoy the benefits of car shopping on the Internet without wrecking your bank account.

Undisputed Benefits

You may already be familiar with some of the biggest car-shopping sites, such as Autobytel (http://www.autobytel.com), AutoTrader (http://www.autotrader.com), AutoWeb (http://www.autoweb.com), CarClub.com (http://www.carclub.com), Cars.com (http://www.cars.com), and CarsDirect.com (http://www.carsdirect.com). There are even car auction sites, such eBayMotors (http://www.ebaymotors.com). In addition, informational sites, such as Kelley Blue Book (KBB; http://www.kbb.com) and Edmunds (http://www.edmunds.com), help you find an invoice price for a new car or approximate the value of just about any used car on the market.

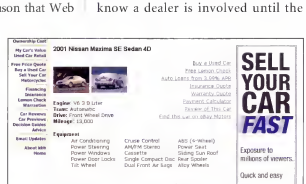
There's one crucial reason that Web car research and shopping sites are so popular: "These sites pierce the veil of pricing," says Chuck Hoover of CarsDirect.com. And with that information, says Chip Perry, CEO of AutoTrader.com, savvy users can "level the playing field with the dealers."

Here's one example of how quickly you can find information to boost your bargaining power. We cruised to CarsDirect.com to search for a new 2003 Chevy Cavalier in a Beverly Hills ZIP code (90210). Within a minute, we found the invoice price of $15,508 and the MSRP (Manufacturer's Suggested Retail Price) of $16,295. The same car on AutoTrader.com had an invoice price of $15,127 and an MSRP of $16,140. KBB lists a base invoice price of $15,272 and a retail price of $16,295.

Print pricing sheets, take them with you to the dealership, and use that information to leverage your negotiations. But be wary. The above numbers don't match exactly because suggested retail prices change several times during the course of the year due to fluctuations in supply and demand and because some sites don't include extra charges (such as so-called "advertising fees") that some dealers throw in. That discrepancy is just one reason you'll want to be cautious and thorough during your research.

Car Shopping Cautions

Every car-shopping pundit we interviewed repeated the same warning for online car shoppers: Do your homework. Understanding the purpose of a car-related site will help you keep in perspective the information you find. Scott Weitzman, senior director of automotive Internet research at J.D. Power and Associates, says that in many cases, you may not know a dealer is involved until the



The Kelley Blue Book site has an immense collection of independent car-buying information. You can even find the approximate retail value of a used car that has a quirky list of options.

very end of a Web-based research session, so be sure to protect your personal information.

Guard your info. If you contact a shopping site, assume that you're in direct contact with a salesperson. Car consumer advocate and author Remar Sutton suggests that you raise the security level in your Web browser so that cookies from such sites can't help the site owners track your activities on a site without your knowledge.

If you want to request information from a site or dealership, use a secondary email account. To get a price quote, you may have to submit your address and phone number, but Weitzman says, "If a Web site [is] asking them for credit information or Social Security numbers, they should certainly be leery." If you're hesitant about providing personal information, Weitzman says keep looking—chances are another site will provide similar information and won't force you into making personal disclosures.

The dealers rule. However, Weitzman doesn't discourage all interaction with shopping sites; in all likelihood, these sites will guide you to a local salesperson, anyway. He says the "only viable alternative" to haggling with a dealership is to use a service such as CarsDirect.com, which acts as a broker to close the deal for you. CarsDirect.com will actually buy the car you want from a dealer and then sell the car to you, after adding service fees.

We Brake For These Sites:

Consumer Reports
(http://www.consumerreports.org)
FOR: Objective car reviews and reliability ratings

National Highway Traffic Safety Administration
(http://nhtsa.gov)
FOR: Vehicle crash ratings

CARFAX
(http://carfax.com)
FOR: Verifying a used vehicle's ownership/damage history

Kelley Blue Book
(http://www.kbb.com)
Edmunds.com
(http://www.edmunds.com)
FOR: Determining a vehicle's value and car reviews

Other sites will help you find the car you want and refer you to someone who can start the buying process, but only at dealerships in a specified network. Still others, such as AutoTrader.com, work a bit like a massive newspaper classified ads section, with listings from all over the country, and you can use the information you find to contact the dealership directly.

In short, consider the site's reason for being as you weigh the value of the information you find. Balance out that information using information from sites, such as KBB.com and Edmunds.com, which aren't as heavily influenced by dealerships.

As you browse for your next set of wheels, don't forget a few car-buying fundamentals.

Sutton says that as you shop, "Find a source that does not require you to sign an arbitration agreement." Some dealerships introduce these agreements in the last round of paperwork, and signing it may revoke your right to sue if you're defrauded.

Sutton also says it's a mistake to commit to a value on your trade-in using the Web. He says many dealerships will offer you a low price on a new car to reduce haggling, with the idea that they'll make higher profits by lowballing (offering less than full value for) your trade-in or nudging you toward their financing. Also remember these tips:

- Don't buy a car on your first trip to a dealership or Web site. Resist the temptation to buy on impulse. Use the objective reviews at Consumer Reports (http://www.consumerreports.org) to find a car that suits your needs. You can subscribe for $5 per month.
- Remember that you should negotiate the final car price, your financing rate, and your trade-in separately. Sutton says the best financing rates often come from credit unions.
- Negotiate the sale price based on the monthly payment you want to pay only at your own economic peril.
- Pay a mechanic to inspect a used car and consult a mechanic familiar with the make of car you're test driving.
- Trust your research and be prepared to walk away if anything at all about the transaction makes you distrustful or uncertain.

Seal The Deal

There's no doubt that the Internet is revolutionizing the car-buying process, but view any money-saving guarantees and conveniences with a skeptical eye. Don't bounce from site to site offering up your personal information and credit history. And take the time to do some quality reading. We recommend "Don't Get Taken Every Time" by Sutton and "Buying A Car For Dummies" by Deanna Sclar. Both will refresh your car-buying skills and better arm you for your trip to the dealership. ▮▮

BY NATHAN CHANDLER

0 To 60 In A Few Years

After enjoying tremendous recent growth, the percentage of new-vehicle shoppers using the Web for research has stabilized at about **60%.**

Percentage of new vehicle purchases made online: **4.**

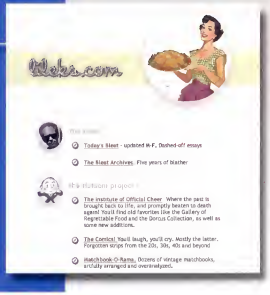
The average shopper visits **seven Web sites** and spends about **five hours** researching a vehicle on the Web.

Source: KBB

Lileks.com

All-American Graffiti

It's Just One Guy's Opinion At Lileks.com



We can agree that the Web is a good thing, but the information superhighway is the least of it. Imagine you're a pastry aficionado whose job transfers you from a cosmopolitan metro area to an isolated outpost where the pinnacle of cuisine is cocktail weenies in BBQ sauce. What better route than ecommerce to keep you in baklava?

Egalitarian forum that it is, the Web makes self-publishers out of everyone who can afford the cost of a few megabytes of server space. Never mind that a disturbing majority appear to have never learned basic grammar skills or the location of their spell-checker commands; what they have to say is about as interesting as tile grout.

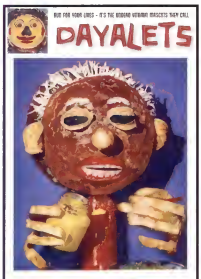
Yet this month we're taking you to a Web site of some lone guy whose offerings are largely unaffiliated with any commercial enterprise (http://www.lileks.com)? Yes. We are.

You Have Just Entered The Lileks Zone

James Lileks is different. He's a columnist for the Minneapolis *Star-Tribune* and a syndicated political humorist, so he knows when and when not to combine apostrophes and the letter S. He also has a sense of humor so dry it's been described as dehydrated and a knack for presenting the world from a perspective that ranges from slightly skewed to mercilessly skewering.

You will know you're at the right place when you find yourself greeted by a cheery illustration of a tiny-waisted 1950s domestic goddess hoisting a platter of glistening, gelatinous goo.

The home page's layout is clean and bonehead-simple to follow, little more than a laundry list of text links. Scroll down and start anywhere.



Roadkill? Victim from the next season of "The Sopranos"? No, it's worse! Nothing says "good nutrition" like one of these Dayalets vitamin poster children.

No, wait. On second thought, we recommend starting at the very bottom, investing a few minutes with the Your Host and FAQ pages, which will serve as a brief primer on who this James Lileks character is. And if you want to see pictures of his daughter (the Gnat) and his dog (Jasper), you can do that too.

As for the rest of the home page, we've been staring at it for days, trying to find the perfect metaphor for its grab bag of contents. We've failed. The best we can come up with is the shopping cart of a street person, filled with a puzzling array of seemingly unrelated bits and pieces . . . a fragmentary code which, if it can be cracked, will provide you with a key to the mind of the one who has harvested its components with such tender care.

On the other hand, if you've already cultivated a warped appreciation for mid-20th-century kitsch, you may have found a kindred spirit.

On The Bleat

Columnists write, of course, and when conditioned under the whip of newspaper deadlines, they tend to get on a roll. That's why, every morning of the workweek, a trip to Lileks.com will reward you with an installment as fresh as your coffee.

Click Today's Bleat for the column du jour or, as Lileks describes them,

"intemperate reactionary screeds." As of this paragraph, the Bleat of the day is an alternately charming and sobering account of the wearying effects of his toddler's refusal to sleep through the night, juxtaposed against a televised backdrop of war coverage, live from Iraq.

Overall, we're occasionally reminded of a brainier Dave Barry, not nearly so focused on bodily functions. But maybe that's only because both writers elicit laughter at roughly the same rate, whether Lileks is firing off a report from the front lines of parenthood or postulating a theory on why it's much easier for American movie fans to bond with Soviet villains than Nazis.

One of the biggest departures from Barry is that Lileks can be almost viciously acerbic. He doesn't always try to be funny, either, when it wouldn't be appropriate. Some mornings you wake up and the first news you hear from the outside world is that the space shuttle has broken up on reentry or a suicide bomber has killed and wounded more than 100 people in a cafe. Lileks doesn't try to conceal the sorrow or the outrage but rather conveys it in terms that provide plenty of food for thought.

To comb through Bleats new and old, click The Bleat Archives. The year and month chronology is obvious (although punctuated by a year and a half of silence), but beyond that, you're on your own. There isn't a great deal of consistency in the layout down at the day-by-day level. Sometimes the entries are individually dated. Sometimes they're clustered in weeklong chunks. Sometimes they're in a frame-based layout, and elsewhere . . . you get the idea. Leave a trail of breadcrumbs if you're going to be there awhile.

New, Improved Flotsam—Now With 20% Less Jetsam

Drop below the link for The Bleat Archives and you'll arrive at The Flotsam Project, as close to a time machine as you're likely to find on the Web. Imagine a truckload of wonderfully tacky flea-market merchandise crashing into a symposium on American cultural anthropology, just outside one of Walt Disney's "World Of Tomorrow" expos.

The Institute Of Official Cheer. Sorry, not many deep thoughts here, just a well-deserved flaying of a national pop culture you'll gladly stand in line to disavow. Each exhibit consists of a photo tour depicting a past that isn't nearly as distant as it should be. As for the commentary, it's so lacerating you may want to keep some iodine handy.

Highlights? Well, they're all highlights, but you may as well begin with The Gallery Of Regrettable Food, an archival collection of cookbook content, promotional recipes, illustrations, and advertisement photos of chow, all of it so nauseating you'll wonder how our recent ancestors managed to keep it down long enough to survive.

Then, for sheer, unadulterated horror, move along to the Dayalets vitamin mascots: photographs of nightmarish food-based sculptures intended to terrify kids into taking their vitamins by demonstrating the perils of an unbalanced diet.

Travel buffs won't want to miss The Grooviest Motel In Wisconsin. Egypt has the pyramids, India the Taj Mahal, and in the late 1960s, a cabal of criminally tasteless Wisconsinites conspired to build the Gobbler, a swank, space-age motel and supper club shaped like a turkey. Relive its glory days with a tour extracted from the Gobbler's own brochure. If your eyes begin to water, don't worry: it's just the decor, the very sight of which would instantly blind Martha Stewart.

And no sharp-dressed man would think of skipping the Dorcus Collection, full of fashion statements so excruciating they make Austin Powers look like a member of Parliament.

There's plenty more, too, and that's the problem. Intelligent life really came up with this stuff.

In print and out of fashion. Forget the news. The real way to take the pulse of the nation is through its art and commerce, which is where a

Tips For Using Lileks.com

It's more honest than stealing the towels. Sure, you love the Gobbler Motel, and you'd like nothing more than to show your friends and co-workers that you stayed there and survived its assault upon the senses. Too bad; it's gone the way of shag carpet and other dinosaurs. But you can still bring a little bit of the old Gobbler magic home to your PC, with free wallpaper ready for download. Tough it out until the end of the tour; or, if you don't have the stomach for that, go to the source: http://lileks.com/institute/motel/giftshop.html.

Learn from our mistakes. There are two kinds of computer users in the world: those who bring food and drink to the workstation, and those who don't. If you fall into the former camp, it's important to time your bites and sips. Avoid mouthfuls before pages have loaded and you're familiar with their contents. Otherwise, sooner or later you're going to spray the monitor. And before you ask, yes, we had to wipe our screen more than once.

Be Quick. If you haven't yet augmented your PC's operating system with Apple Computer's QuickTime for Windows (http://www.apple.com/quicktime/products/qt), you might as well take care of that now. They aren't frequent, but now and again, you might stumble across a page with an embedded QuickTime file. If James Lileks is going to go to all the trouble of pairing an archaic Hamm's Beer matchbook with an audio clip of the company's now-politically-incorrect Native American-flavored "sky blue waters" theme song, the least you can do is be ready to listen.

couple of the other sections fit in. At the Old Ad Archive, you can whiz through a half-century's worth of newspaper ads rescued from microfilm. And if you don't think the world was different in the 1920s, when was the last time you saw an ad tempting you with a smartly tailored overcoat made of beaver lamb and wombat?

At The Comics, grimace at the nation's lame and often overtly racist sense of humor, back when life's troubles could be cleared up with Philip Morris cigarettes and Postum. Although this sage bit of World War I advice stands out: "Never wear patent leather pumps in the trenches."

Weird collectibles. Everybody knows at least one: a person who goes geeky over accumulating the most inexplicable choice of knick-knacks. Which would be fine, if it weren't for the demented glee they take in forcing you to examine every single specimen.

The rest of The Flotsam Project isn't like that. Usually. At least most of the commentary consists of the quips you wish you could come up with on the spur of the moment. You'll notice, too, that because everything has to be flat enough to scan, it's all paper-related, from matchbooks to money.

There's also a seemingly endless collection of postcards from the sort of motels and eateries that flourished before corporations dominated our highways. Much of it is sweetly nostalgic, as befitting a dear departed age of optimism, while some of it leaves the impression that post-war America was built and populated by such doofuses you have to wonder how we ever made the Soviet Union so edgy.

Finally, there's the Bureau Of Corporate Allegory, the retirement home of the titanic, mytho-American figures, most of whom appear to have been fathered by Zeus, that used to adorn stock certificates.

Notes From A Bygone Era

The remainder of the site will, for most, be of more specialized interest.

Urban Studies. Here you'll find photos of and reflections on the cityscapes of New York, Minneapolis, and Lileks' hometown of Fargo, North Dakota. Rather than post shots of any old structure, Lileks commemorates the architectural motifs and details that lent buildings personality and are rarely seen new today—gargoyles and other forms of urban gothic, for example, rather than streamlined glass efficiency.

Lileks himself says it best, in this lovely passage: "I'm the worst sort of native son: I scoffed and rolled my eyes as a restless adolescent and lit out for the big city as soon as possible. Now, looking back, I want it all the way it was, better than it was, and I read too much into old photos."

Is it our imagination, or can you just not get good dermatological advice from matchbooks anymore?

Miscellaneous Works. You have to admit, the man knows his way around all 26 letters of the alphabet, and under Scribble, you'll find even more samples from a variety of sources. Finally, for burgeoning Lileks fanatics, there's Click, with a further selection of photos.

Bleaten Into Submission

If you visit for nothing else, Today's Bleat (often thought-provoking, sometimes purely entertaining) makes for a worthwhile addition to your morning routine. It's the rest of the site that's so dangerous, the online equivalent of the oiliest, saltiest potato chips in the world.

"Just one more," you'll bargain. "One more peek at the currency of Biafra! One more breathless installment of Mr. Coffee Nerves! One more . . . ."

Oh, it's lunchtime already? ❚❚

BY BRIAN HODGE

Lileks.com Fact Sheet

As is appropriate for a fellow with a soft spot for the Mom-and-Pop era of American culture, Lileks.com is a one-man operation; a feat that only gets more impressive when you fully appreciate how exhaustive the Web site truly is.

Lileks.com rose from two main foundations laid down in 1996 and 1997, a period of what James Lileks calls underemployment. First was an online journal, which seemed like a novel idea at the time; this evolved into The Bleat, making its debut in February 1997.

Around the same time, he came across an old cookbook: "Specialties Of The House." He found it so uniquely unappetizing that, lacking anything better to add to his new Web site, he began posting portions of the book, along with ads from his *Life* magazine collection, then lampooning them with his own text. The site's unexpected popularity led to more cookbooks, more content, and thus was born "The Gallery of Regrettable Food," which even made its way into book form in 2001 from Random House.

The Bleat was derailed after only six months, when Lileks' professional life perked up again with a newspaper column and radio show, and he lacked sufficient time to devote to it. Somehow he managed to find it again, and The Bleat was reborn in January 1999, along with an explosion of additional pop culture content. ❚

Web Tips

Enhance Your Time Online

Knock on the front door of the U.S. Government by clicking over to FirstGov.gov, a portal to all online state and federal government services.

Cut The Red (& White & Blue) Tape

When you think of government services, do you think of long lines and endless red tape? It would be great if these services were online, wouldn't it? Here's the reality: Some are and some aren't. And there's variation among states, too, so what's a poor taxpayer to do? We suggest paying a visit to FirstGov.gov (http://www.firstgov.gov). Created to save time and maximize the simplicity and efficiency of the World Wide Web, this site is a one-stop portal to all government services online: compare Medicare options, renew your car registration, buy coins, file your taxes, get government publications, and find government jobs. Whew! That list is just about as long as the line at the DMV.

Your Special Day In History

We all know that your birthday is an important day because it was the day you came into the world. It's very possible, however, that it has some additional significance or importance in the course of history. Check for yourself with The History Channel's What Happened On Your Birthday? feature (http://www.historychannel.com/today). In addition to general historical interest, you can search specifically for events related to Automotive History, the Civil War, the Cold War, Vietnam War, WWII, the Old West, Crime, Entertainment, Literature, Technology, and Wall Street. All that stuff on *your* birthday? Wow; you really are special.

You'll find a great deal of simple, do-it-yourself repair tips and tricks for all major appliances at the easy-to-navigate RepairClinic.com.

The Six Great Lakes?

OK, in grade school, we all learned about those big five lakes: Erie, Huron, Michigan, Ontario, and Superior. But did you know about little, lowly Lake St. Clair? This heart-shaped body of water, tiny only when compared to its big brothers, is nestled between Lakes Huron and Erie. This and other lake lore are only a splash away at the Great Lakes Information Network (http://www.great-lakes.net). But don't let this bit of trivia fool you into thinking that the GLIN isn't a great resource for lovers of the great outdoors. This site is overflowing with information about the region's environment, economy, education, and more. Be sure to swim around in the Tourism section, where you'll discover a huge list of lake-related recreational opportunities.

Fridge On The Fritz

What's that old joke? The moment an appliance goes out of warranty is the moment it breaks. Well, don't pull your hair out and don't run out and buy a new one just because your appliance went on the fritz. Look into how to repair it at RepairClinic.com (http://www.repairclinic.com). Front and center here is a huge selection of spare parts that inspired do-it-yourselfers can search through and then buy directly from this site. If you have the part number, super; if not, there are a series of questions the Part Detective asks to identify the right one. If this all seems like too much work, check out the Tip Of The Day at the bottom right of the home page instead. Short, helpful, and fun, the tips focus more on preventative maintenance than making costly repairs.

The Price Is Right

If you're not a bargain hunter, chances are it's because you like the bargains more than you like the hunting part. Still, everyone likes to grab a good deal, especially when the grabbing is easy. Enter PriceGrabber.com (http://www.pricegrabber.com). Search for products in a number of categories from Books, Movies, and Music to Computers, Software, and Consumer Electronics; you'll even find Jewelry and Office Products. Even if you have a preferred shop you'd like to buy from, it's worth your while to look up your prospective purchase here, check for super saver prices, and read the customer reviews. It beats driving from store to store looking at price tags.

find it online

Compiled by Joshua Gulick

Tooling Along The Information Highway

MSN Autos

http://autos.msn.com

MSN Autos has information, such as finance, insurance, and warranties, about buying new or used cars. If you have a car, click My Car and use your .NET email account to sign in. If you don't have a .NET account, register free at http://www.msn.com. After you enter basic information about your car (for as many as nine cars), the My Car page displays info about recalls and suggests a service date. Look for local service facilities and schedule appointments online. The site has links to local auto-related Web sites, such as your state's DMV.

Better Business Bureau

http://www.bbb.org/library/tipscar.asp

That noise turned out to be more than an irritation; your car refuses to start. Should you call a tow truck or a service with a flatbed? The Better Business Bureau's tips about car repair and maintenance lets you solve such quandaries from home. The Web site explains how to prevent some problems with preventative maintenance and shows you how to inspect your repair bill. If you're concerned about a repair shop, use the BBB's Web site to learn more about the shop's reputation or file a complaint.

Car Talk

http://cartalk.cars.com

Repairing your car doesn't have to be a headache. Tom and Ray, hosts of car repair radio show Car Talk, share automotive tips, tricks, and laughs on their Web site. If you've never listened to Click and Clack, click Our Lousy Radio Show to hear sound bites. Check out the Car Talk column. Once you get your humor fix, visit the Car Talk Bulletin Boards to read listener questions and answers, which include topics on automotive repair and choosing a car that accommodates tall drivers. Click and Clack occasionally grace the Bulletin Boards.

DoItYourself.com

http://doityourself.com/auto

Does your basement double as a repair center? If you take pride in your home DIY accomplishments, test your skills on a new challenge: your car. DoItYourself.com's Auto Repair And Care Tips section breaks its articles into several categories, such as Is It Time For A Tune-Up Yet? and What You Should Know About Your Car's Drive Train. If you think the section is missing an article, write one and submit it to DoItYourself.com. The Web site also lets readers share experiences in the Automotive Forum.

Kelley Blue Book

http://www.kbb.com

To see what your car's worth, visit Kelley Blue Book's Web site. Many of KBB's features focus on buying or selling a car, but the site also has other car-related features. If you're having trouble with your car, click Lemon Check to order a CARFAX history report. If you're beginning to search for a car, visit Car Reviews to read reviews of many new cars on the market, or check out Car Previews to see cars that will hit the market soon. You can also sign up for the site's customizable email newsletter.

Lemon Law America

http://www.lemonlawamerica.com

You finally figured out whose car has been dropping parts near your driveway. If you're in the repair shop more often than your car, it may qualify for your state's lemon law. Go to Lemon Law America's site, click State Lemon Laws, and choose your state. If you think your car qualifies, return to the main page and click a state for firms in your area that handle lemon law cases. Lemon Law America hasn't identified firms in every state yet, but it will try if you request one. Use this site to find out if other products, such as computers, are lemons, too.

Motley Fool Foolish Car Glossary: Lot Lingo

http://www.fool.com/Car/CarGlossary/GlossaryLotLingo.htm

Before you set foot on a dealership lot, browse Motley Fool's Foolish Car Glossary: Lot Lingo. You can avoid some car sales pitfalls if you understand a few terms, such as Hard Dollars, Looky-Lu, and Upside Down. Many terms include examples. Other terms describe scenarios that may take place off the lot. For example, Bird Dogs recommend a specific dealership and then collect cash from the dealer when you buy a car there.

That's News To You

Finding the appropriate Usenet discussion group to match your interests can be a monumental task. So each month, we scour tens of thousands of newsgroups and highlight ones that delve into popular topics. If your ISP (Internet service provider) doesn't carry these groups, ask it to add the groups to its list. This month we head to the garage and share car repair tips.

rec.autos.antique

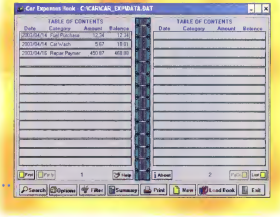
If you're thinking of buying and restoring an antique auto, browse the posts at rec.autos.antique. Users here post questions and answers on many different antique restoration topics, such as replacing headlights and fixing brakes. You'll also find plenty of ads for antique items ranging from complete vehicles to vintage license plates. Posters often use phrases, such as WTB (want to buy) and WTS (want to sell) to indicate types of ads.

rec.autos.tech

If you need advice while repairing your vehicle or have questions about service facilities but don't want to schedule an appointment with a technician, post your question on rec.autos.tech. Users post questions on topics such as brake line replacement, overheating engines, and oil changes. We read about the "short stick" scam, in which gas station attendants dip the stick part way and claim your oil is low. Readers range from amateurs to pros, but don't expect a professional to respond to every question and always get a second opinion before you follow someone's advice. After all, it's your car.

Share The Wares

Some of the best apples in the online orchard are the free (or free to try) programs available for download. Each month we feature highlights from our pickings. This month it's time to leave that record book behind and embrace the digital age.



Car Book Plus 5.1 lets you keep track of your car's mileage and maintenance.

Car Book Plus 5.1

http://www.primasoft.com

The moment you lose your 5-year-old mileage book, you'll wish you'd tracked your car's mileage and maintenance on a computer. If you want to move your records to a safe place before a family member accidentally tosses them in a gas station garbage can, take a look at PrimaSoft's Car Book Plus 5.1. This software package includes two programs: Car Expenses Book and Car Mileage Book.

Car Expenses Book lets you create records for each transaction. To enter a transaction, double-click an empty entry and fill out the requested information. Car Expenses Book requires the transaction date (Calendar), Category, and Cost, but you can also keep track of the Odometer State, the address of the business, the businesses phone number, and the product or service type. The Category field has a drop-down menu that includes Car Wash, Fuel Purchase, Insurance Fee, and others. You can also add your own categories. Once you enter your transactions, the Summary window displays your expenses by category.

Car Mileage Book is similar to its counterpart. You can enter the date, name your trip, and describe your trip in the record's fields. If you take certain trips often (for example, to and from work), you can create Regular Trip templates. You can use the template to enter mileage information without having to type the same description each day. The program also includes a calculator. You can try Car Book Plus free or buy it for $22.

Kar Kare 2.6

http://pdacentral.ozbytes.net.au/palm/preview/55423.html

Kar Kare 2.6 lets you keep track of mileage and maintenance on your Palm OS PDA (personal digital assistant). The software also tracks your odometer information and displays maintenance alerts. You can use Kar Kare to track as many as four vehicles. To install Kar Kare, download the program and HotSync both files (Karkare2.prc and Kksetup.prc) to your PDA, then run Kksetup.prc. You can try Kar Kare free and register it for $10 at (http://www.geocities.com/leemon1/register.html).

NEC
MultiSync LCD1850X
XtraView+

NEC

See more of your ideas.
Less of your monitor.

Introducing the world's first, most complete line of thin-frame options from the best-selling brand of flat panel monitors. More picture. Less frame. Nothing to distract you from amazing color and clarity, or take away from edge-to-edge flicker-free viewing. At just 18.5 mm per side, it's the industry's thinnest frame. Plus, the MultiSync® LCD1850X, LCD1550X, LCD1550M and LCD1550V offer a choice of sizes and colors; touchscreen and protective glass technologies; height-adjustable stands; portrait and landscape viewing; and an endless array of multimedia options. And their sleek designs provide virtually seamless viewing in multi-monitor applications.

So broaden your horizons. Choose Ambix™ for digital/analog dual input technology that ensures long-term compatibility. XtraView+™ for wide angle viewing. OmniColor™ technology for precise color values. Or LiquidView™ for high-resolution readability. It's innovation that lets you see more of what you want. Less of what you don't.

Learn more at www.necthinframe.com or call 888-NEC-MITS.

SEE MORE.™

NEC ranked as the #1 flat panel monitor branded vendor in the Stanford Resource—iSuppli Flat Panel Monitrak® Quarterly Report, Q2 '01. MultiSync is a registered trademark, and Ambix, XtraView+, OmniColor and LiquidView are trademarks of NEC-Mitsubishi Electronics Display of America, Inc.

©2002 NEC-Mitsubishi Electronics Display of America, Inc.
All rights reserved. Simulated images in monitors

NEC/MITSUBISHI
NEC-MITSUBISHI ELECTRONICS DISPLAY

Cover Story

Welcome To The World Of Digital

Before computers, a picture was a picture. Sure, it was worth a thousand words, but unlike words, once you took a photo, it was frozen. You couldn't take Wite*Out to it or rewrite an eyebrow; you snapped your shot, and that was that.

Not any more. Digital imaging has made pictures as flexible as Silly Putty. With digital cameras, scanners, editing software, and printers, millions of people are sharing their pictures in ways never before thought possible, editing them to make them better and freeing themselves of the century-old dependence on professional photo-processing shops.

Digital cameras are the heart of the digital imaging experience. Cheaper and better than ever, affordable cameras now produce even better images than film cameras for many uses. It's no wonder consumer digital camera sales jumped by 27% between 2001 and 2002, according to Michelle Slaughter of InfoTrends Research. In 2003, 3-megapixel cameras are expected to become the most-purchased kind; photo experts say these cameras match film quality at sizes as large as 5 inches x 7 inches.

The newest trend in digital cameras is camera-phones, now available through most wireless carriers. The pictures aren't high quality, but you might remember to bring your cell phone along on jaunts when you forget your camera.

What goes into the PC usually comes out on an inkjet printer. The sales of multifunction machines are booming, according to Bruce Thatcher, an analyst with research firm CAP Ventures; so are the sales of printers designed to pop out

Catch The Digital Camera Bug 56
Reality DV 60
Scan Your Way To Success 64
Image-Editing 101 67
Output Is King: A Printer Primer 70
Glossary Of Terms 73

professional-quality photos. The next step, Thatcher says, is a universal standard for plugging cameras directly into printers without having a computer in between; you can do that with some printers and cameras now, but you have to choose your hardware carefully.

Because our lives aren't entirely digital yet, we have scanners. Kerry Flatley, an analyst at research firm InfoTrends, says fewer people are buying standalone scanners nowadays, and more are going for those all-in-one printers/copiers/scanners, which makes sense, as more than two-thirds of the folks she surveyed who have scanners use them as copying machines. A scanner is key if you're trying to get the kids' artwork or your nondigital photos onto the Web.

Tying all of these imaging elements together is editing software. From the free, limited capability IrfanView (http://www.irfanview.com) to professional standby Photoshop (http://www.adobe.com), these all-purpose picture-fixers help turn amateur photos into something closer to the masterpieces you originally envisioned.

Read On

Bringing images into your digital life can change both the way you live and the way you work. In the following articles, we'll show you how to use cameras, scanners, printers, and software to do a few projects.

What a card! Hand-drawn holiday cards are all well and good. But with a scanner and inkjet printer, you can create a collage of the kids' artwork, family photos, and professional-looking typefaces and then print out 50 copies in full color. Custom greeting-card programs, such as Broderbund's PrintMaster Greeting Cards Deluxe (http://www.broderbund.com), make it easy.

Vacation snaps. If your friends and family won't come over and see your vacation photos, scan the photos, slap them up on the Web or turn them into a video slideshow, and send them around on VCD (Video CD) with narration.

Who was that? Memory experts say people remember pictures better than names. Use a camera phone or a small digital camera, such as the Sony Cybershot U10 to take a quick snapshot of people you meet. Software such as ACT! For Windows (http://www.act.com) and AddressAlbum on PalmOS (http://www.evolutionary.com) is included with many camera phones, and all support adding photos to address books. With Microsoft Outlook, you can note the file name of your picture in a contact's Notes field or keep a list of names and pictures in your Drafts folder.

Visual notes. Take a small digital camera to trade shows and take quick snaps of everything that interests you. When you get back to your hotel, download the images into a photo-organizing program, such as Apple's iPhoto (http://www.apple.com/iphoto) or Lifescape's Picasa (http://www.lifescapeinc.com/picasa), on your notebook and annotate them. ■

BY SASCHA SEGAN

Catch The Digital Camera Bug

More Affordable, More Powerful: Now's The Time To Buy

DIGITAL CAMERAS ARE TAKING the guesswork out of photography. Now, instead of hoping you've taken a good photo, with a digital camera, you can actually check your snapshots on a built-in LCD (liquid-crystal display) screen. And where once digital cameras were expensive and low quality, now you can get a camera for less than $200 that makes professional-quality 4-inch x 6-inch prints at your local photo lab or a camera for less than $50 that's great for emailing headshots to your far-flung friends and family.

"The nature of the tool is expanding. [Digital cameras] change the way you shoot, allowing instant editing," says James Ramer, associate chair of the photography department at New York's Parsons School of Design.

With all of these advantages, it's no wonder digital camera sales are booming. According to Michelle Slaughter, digital camera analyst with research firm InfoTrends, there were 9.5 million digital cameras sold last year alone.

Just Like Film, But Not

A camera focuses light onto a medium that reacts to light. That's true of your eye (which uses an organic lens to focus light onto your retina), it's true of a film camera (which uses a glass lens to focus light onto a piece of film) and it's true of a digital camera, which also uses a glass lens, but focuses the light onto an array of sensors.

To change the focus distance on a camera, you have to move the lens. (Your eye focuses by changing the curvature of its flexible lens, but camera lenses are hard, so you have to move them.) Fixed-focus cameras keep the lens in one place, relying on high depth of field (see the "Deep Thoughts: Know Your Depth of Field" sidebar) to keep a range of subjects in focus. Autofocus cameras have two ways to judge where to move the lens: **active autofocus** cameras bounce a pulse of infrared light off of their subjects to see how far away they are, and **passive autofocus** cameras analyze a range of images to see which one has the best contrast between adjacent points. Active autofocus works better than passive autofocus in low light.

Speaking of light, a camera needs to know how much light's out there in order to capture the right amount. Both digital and film cameras check available light with a photosensor and adjust the aperture (width) of the shutter opening and the speed of the shutter to get the right amount of light.

In a film camera, the light now hits the film. In digital cameras, either a CCD (charge-coupled device) or CMOS (complementary metal-oxide semiconductor) chip replaces the film. The chip is divided into millions of tiny pixels. If light hits a square, it generates an electrical charge.

Once a film camera has recorded its image, its job is done. Not so with digital cameras. A computer in the camera now must take the electrical values from the sensor, usually millions of individual values, and assemble them into recognizable order. If it's saving the pictures in JPEG (Joint Photographic Experts Group) format to save space, it has to crunch some numbers to compress the data. Finally, the camera writes the data to a memory chip.

Which One Is Better?

What does all this technical wizardry add up to? There are certainly still reasons you may want a film camera, but the arguments for going digital are compelling: convenience,

flexibility, and even cost over the long run.

Digital cameras are more flexible than film cameras. You can easily put a digital shot on a Web page, send it in an email message, save it on your hard drive, burn it to a CD, or print it at a photo lab. If you're unsure about a shot, you can quickly review it, toss it out, and take another one.

"People really want to share, delete, and review their photos," says Joe Paglia, public relations manager for Kodak.

Digital cameras can be smaller. Film cameras are limited by the size of the film and the film spool. Digital cameras can be as flat as a credit card or as skinny as a pen; they can be carried on a lanyard around your neck or slipped into a shirt pocket.

The SiPix StyleCam Blink is a toy camera: less than $50, tiny, lacking an LCD (liquid-crystal display) screen, and taking low-resolution pictures. It's useful for email shots or giving to kids.

Film cameras are often less expensive, at least to begin with. With a single-use film camera, you don't have to worry about getting sand in your expensive camera at the beach. Film cameras are faster: They don't need to compress and save digital data, and you can snap off a bunch of shots more quickly.

Digital cameras, on the other hand, can be less expensive in the long term. Developing and printing a 24-shot roll of 35mm film at PhotoWorks, formerly known as Seattle FilmWorks, a national develop-by-mail service, costs $14. With a digital camera, "developing" is free, and you need print only the pictures you want paper copies of. That can save you hundreds of dollars over the life of a camera.

Film cameras perform better in low light. Film technology is way ahead of CCD technology when it comes to capturing very small amounts of light; for most film cameras nowadays, you can get ISO 3200 film, which just might be able to get you a shot of a relay race at midnight in an underground bunker, without using a flash. Most digital cameras are stuck with ISO 400, says Michael Tenalio, worldwide product manager of digital cameras for Kodak. Although that's great for most situations, a combination of low light and high motion will stymie many digital cameras.

Inexpensive film cameras will also provide prints of higher-quality than those from inexpensive digital cameras. But even midrange digital cameras create images that are indistinguishable from film for 4 x 6 prints and those you display on computer screens.

Feel Out The Features

Shopping for a digital camera usually means being bombarded with semicomprehensible jargon. You need to know your camera's resolution and zoom factor and whether it's autofocus or fixed focus.

Resolution. The basic quality of an image, its resolution, is the single most important statistic on a digital camera. Resolution is measured in megapixels, or millions of color pixels. In general, a 1-megapixel camera is fine for producing 4 x 6 prints at home and for sending images in email or for posting to the Web. (One megapixel usually translates to 1,280 x 960 pixels.) A 2-megapixel camera can produce professional-quality 4 x 6 prints. A higher megapixel rating means larger, high-quality prints or more flexibility for zooming and cropping. A 3-megapixel camera, with images at resolutions of 2,048 x 1,536, can produce 5 x 7 professional-quality prints; for top-quality 8 x 10s, you may want a 4-megapixel model.

If a camera advertises interpolated resolution, it's talking about an enhanced resolution; it means it's using something, such as software, to increase the quality of the image that you could do yourself in Photoshop. Always look at the actual resolution, not the interpolated resolution.

But that's not to say that all cameras with the same resolution produce the same quality images. The Olympus C-5050, for instance, took sharper shots than the Olympus C-50 in a *Smart Computing* test (mentioned in "Picture This!" in our March 2003 issue on pages 56-60). Both cameras are 5-megapixel models; the difference is in the lens.

Glass vs. plastic. Glass holds its shape better than plastic, so glass lenses provide more consistently high-quality images. Aspherical lenses give better focus at the edges of an image; the bowed edge of ordinary lenses means they lose a little bit of focus at the edge, according to Jon Knaur, senior product manager for the consumer products group at Olympus.

Larger lenses are often faster than smaller lenses. A faster lens opens wider to let in more light, allowing for faster shutter speeds and better performance in low light. The lower-end lenses may open no lower than f4.8; Olympus's high-end lenses are f1.8, Knaur says. On top-end cameras, you'll find removable lenses or lenses that are interchangeable with film-camera lenses.

Zoom. Many lenses offer some form of zoom. Digital zoom isn't really zoom; it's a Photoshop-esque trick by which the camera crops and

blows up part of the real image. Ignore digital zoom for optical zoom, which is real zoom, and involves moving the lens.

Most digital cameras have autofocus. High-end cameras may let you manually focus, as well, but they may show the focused image through a separate viewfinder or on the LCD, so you can't tell focus with perfect precision. Truly professional cameras, digital SLRs (single lens reflexes), offer full manual focus through the main lens, so what you see is truly what you get. But even on low-end cameras, you should look for a macro mode, which switches the position of the lens so you can snap close-ups. Without a macro mode, cameras may not be able to get clear shots of subjects that are only a few feet away.

Flash. No matter how fabulous your lens, sometimes you'll need a flash. Most cameras will offer regular flash and **red-eye flash** (which blinks a few preflashes to shrink people's pupils, so you don't catch the red of their retinas in your image). **Fill flash** helps you take pictures of subjects against bright backgrounds without getting deep shadows on the faces. **Slow sync flash** lets you create dramatic sports photography. High-end cameras may have a **flash shoe**, an attachment for separate flashes. Detachable flashes provide brighter light (so you can take pictures with subjects at greater distances) and let you move them around so the light hits the subjects from an angle.

Digital Only

Most of the features above apply both to digital and film cameras. Two critical issues that only apply with digital cameras, though, are startup time and shot-to-shot time. These delays are based on the speed of the camera's computer, so higher-end cameras are faster. Cameras without autofocus or zoom lenses (such as the Sony PCG-U1) also start up quickly, because they don't have all that much to start up. (Zoom lenses are a big source of startup delay.) To reduce the delay between shots, higher-end cameras have burst modes that let you take three to five pictures in quick succession and store them to the memory card all at once.

"Many sub-$300 models do not process images very quickly on board the camera," Slaughter says. "You take a picture and wait before you can capture the next image. Higher performance models tend to have larger capacity buffer memories to enable users to capture multiple shots quickly."

Speaking of memory cards, camera manufacturers say the kind of card a

Deep Thoughts:

Know Your Depth Of Field

If you've taken a photo where someone right in front of the camera is sharp but the background is all fuzzy, or vice versa, you've encountered depth of field. A property of optics, **depth of field** is the ability of a lens to capture a range of distances in sharp focus.

Depth of field depends on three things, according to James Ramer, associate chair of the photography department at the Parsons School of Design in New York City. A shorter lens (more wide-angle) has greater depth of field than a longer one (telephoto). A faraway subject has greater depth of field than a nearby subject. And a choked-down shutter (high f-stop, such as f8, f16, etc.) has a greater depth of field than a wide-open shutter.

The good news for snapshot photographers is that digital cameras have far greater depth of field than film cameras. In fact, unless you're focusing on something less than three feet away from the camera or you're using a zoom lens, it can be difficult to get any depth-of-field effect at all.

Why? Digital cameras' sensors are physically much smaller than 35mm film, so to offer a decent angle of view, digital camera lenses must have extremely short focal lengths and thus great depth of field.

If you're trying to avoid depth-of-field effects, keep your subjects at least 6 feet from the camera and shoot in bright light whenever possible.

Experts who want to create depth-of-field effects (say, to emphasize a main subject while blurring the background) can use a digital camera's zoom function or a longer add-on lens in tandem with aperture-priority mode to force the shutter wide open. ▮

With digital cameras, depth-of-field effects are most pronounced when the subject is very close to the camera. Here (top), we manually focused on the lettuce doll, and Strawberry Shortcake fell out of focus. When we pulled the camera away from the three dolls (bottom), our digital camera's autofocus got them all equally sharp.

camera uses doesn't much affect the speed or quality of the camera, at least on consumer-level cameras. Your pictures will be saved to a memory card in a file format, usually JPEG. Using JPEGs saves space, but you lose a little bit of quality. For perfect, archival-quality images, your camera should save in TIFF (Tagged Image File Format) format. High-end cameras offer RAW format, which gives expert photographers more control over the color balance and sharpness of their images.

Many digital cameras, even inexpensive ones, feature movie modes, voice recorders, Photoshop-like sepia filters, or other fancy gimmicks. But you'll likely have to spend some money to get manual controls. Higher-end cameras let you set the shutter speed, aperture, white balance (the color the camera considers white, which is important if you're trying to get the yellow out of indoor lighting), focus point, and even the flash intensity by hand.

Get What You Pay For

Listening to analysts and manufacturers, we ended up dividing the camera market into five tiers.

Toy. Toy cameras generally cost less than $100. They have less than 2-megapixel resolution, fixed focus, no zoom, plastic lenses, no expandable memory, and usually no LCD. They're often very tiny. Toy cameras are good for photos you intend to send via email or post to a Web site and for kids' uses (some are as cheap as $20).

Popular toy cameras include the tiny SiPix StyleCam Blink (less than $50 street), with only 640 x 480 resolution and 8MB of built-in memory, and the Aiptek Pencam ($70), which takes 1,280 x 1,024 resolution pictures and has 16MB of memory. Most phone-cameras are considered toy cameras.

Entry-level. Entry-level cameras cost as much as $200 and have no more than 3-megapixel resolutions but usually less. They have fixed focus, expandable memory, and an LCD. They'll have digital zoom but not optical zoom. Entry-level cameras will get you a decent snapshot and are perfectly acceptable for most basic uses.

The Olympus D-390 ($149) and Kodak CX4200 ($149) are entry-level cameras. Both are 2-megapixel cameras with glass lenses, digital zoom, and few manual controls.

Point-and-shoot. Point-and-shoot cameras, which have become tremendously popular among average consumers, cost as much as $500. Here, you start seeing more manual controls, faster lenses, higher resolutions, and optical zoom. Manual controls on these cameras are usually buried in menus because it's assumed that photographers won't use them all that often.

The Sony Cyber-shot P72 ($329) and Olympus D-560 Zoom ($299) are both midrange point-and-shoot cameras. Both have 3.2 megapixel resolutions, 3X optical zoom, movie modes, and multiple flash and white-balance settings, but they don't offer features such as TIFF image format or many manual settings.

Hobbyist. Hobbyist cameras cost as much as $1,000. Here you'll find the best balance between cutting-edge technology, portability, and ease of use. Hobbyist cameras work perfectly well as quick point-and-shoot cameras, but also feature extensive manual options. They have high-quality lenses and sport up to 5 megapixel resolutions. Many have shoes for removable flashes; a few also have removable lenses.

The Olympus C-5050 ($799) and Canon Powershot G3 ($899) are prime examples of hobbyist cameras. The C-5050 has the solid, heavy feel of a film camera and sports a 5-megapixel sensor and high-end, f1.8 aspherical glass lens. The Powershot G3 has 4-megapixel quality, a 4X optical zoom lens, and manual adjustment of everything from the flash intensity to the autofocus point.

Hobbyist cameras will generally satisfy all but the most demanding amateur photographers. The only things they lack are the perfect manual-focus precision of being able to see right through the lens and compatibility with film-camera lenses. That's when you have to go to the highest level of digital camera.

Don't let its small size fool you. Sony's Cyber-shot P72 ($329) is a powerful point-and-shoot camera, with 3-megapixel resolution, optical zoom, and a movie mode.

D-SLRs. D-SLR (digital single lens reflex) cameras cost more than $1,000, can capture as many as 14 megapixels, and offer all of the manual features professional photographers demand.

For most people, the entry-level and point-and-shoot models are plenty. "Many average, mainstream consumers are purchasing models in the $249 to $499 range," analyst Slaughter says. And now that multimegapixel cameras are less than $200, it's clearly the time to join the digital camera revolution. ■

BY SASCHA SEGAN

Reality DV

An Introduction To Digital Camcorders

Go to any wedding, graduation, company picnic, or maternity ward, and within moments, you'll spot at least three people pointing video cameras the size of paperback novels at someone or something. If you're not one of these people, you may find yourself wondering what you're missing.

DV (digital video) camcorders are more popular than ever, and there are a few good reasons why. In this article, we'll pan over the fundamentals and zoom in for a tight shot or two.

The Digital Difference

If you've done any browsing in the camcorder department of your local megastore recently, you've probably noticed that the digital models vastly outnumber analog models such as 8mm, Hi8, S-VHS, or VHS-C. You've also probably noticed the two most obvious differences between the digital and the analog models: size and price.

Many DV camcorders are considerably smaller than their analog predecessors, and some are downright teeny (one of our writers had a scientific calculator in high school that took up nearly as much space as one of Sony's new MicroMV-format cameras). DV cameras also cost more, generally ranging from around $500 to $1,500 for consumer-grade models from major manufacturers. What do you get for the larger price tag besides a smaller camera?

One of digital video's most prominent selling points is overall image and sound quality. DV camcorders record video at resolutions of 500 horizontal lines per inch or greater, which is at least 25% greater than the analog format. DV camcorders generally reproduce richer, more accurate color. Most use CCD (charge-coupled device) technology to capture images at 680,000 or more pixels per inch. Most DV cameras also use 16-bit or 12-bit PCM (pulse code modulation) technology to record two or four channels of CD-quality digital stereo audio.

Just beyond the high end of the price range are "prosumer" models, such as the Canon GL2 or Sony's HandyCam DCR-VX2000. These units pump up clarity and color fidelity even more by using three CCDs: one for red, one for green, and one for blue.

Beyond hi-fi audio and high-res video, DV camcorders offer additional features. Most incorporate some method of image stabilization, which helps smooth the herk and jerk out of your footage. Most offer a range of on-board scene transitions, such as wipes, fades, and dissolves. Most offer a range of digital effects, letting you give your video a variety of finishes. For example, digital effects might let you shoot footage in slow motion or give everything an old-timey sepia tone, perhaps add a flickering "classic film" feel. Most DV cameras have some type of infrared night mode that can help produce legible footage in low light conditions.

Virtually all DV camcorders feature a digital zoom mode, which uses an electronic method of pixel extrapolation to "fake" ultra long-lens close-ups of 700x or more.

Many DV camcorders feature a snapshot mode that lets you take digital still photos. Some models let you save your photos to a removable memory device (manufacturers such as JVC, Panasonic, and Sharp use SD Memory Cards, for example; Sony camcorders use a proprietary technology the company calls Memory Stick). These cameras generally provide an on-board USB (Universal Serial Bus) port that lets you transfer your photos to your PC.

Last, but certainly not least, DV camcorders make it easier than ever to edit your own movies on your PC. Because the video is digital (stored as 1s and 0s instead of as an analog signal), you can copy your footage to your PC, use editing software to cut and polish it, and copy it back to your camera or to a CD-R (CD-recordable) or DVD-R, with no degradation in quality.

Competition Among Formats

At press time, three DV formats dominated the consumer camcorder market: Digital8, MiniDV, and MicroMV.

Of these three formats, MiniDV is by far the most widespread. Sony's MicroMV format, which first hit the market in 2002, is the newest. Although all three formats provide comparable image and sound quality, there are a few important technical differences among them.

Digital8 camcorders, such as Sony's HandyCam DCR-TRV250, which can be had for less than $400, are slightly less costly than MiniDV or MicroMV models. These units record video to 8mm or Hi8 tape cassettes, capturing 60 minutes of digital footage on a standard 120 minute tape in SP mode. Digital8 camcorders also play back analog 8mm or Hi8 footage, which can be advantageous if you already own an 8mm video camera and have lots of existing tapes lying around. Digital8 technology is proprietary to Sony, and Sony produces the overwhelming majority of Digital8 camcorders. You can find Digital8 units from manufacturers such as Hitachi, but not as readily.

MiniDV uses a 6mm tape cassette that generally costs a few dollars more than an 8mm or Hi8 cassette. The standard DV cassette records 60 minutes of digital video in SP mode and as many as 90 minutes of lesser-quality video in LP mode. The smaller media can allow for smaller cameras (though higher-end models, such as the Canon GL2, are considerably larger than most entry-level units). A range of manufacturers produce MiniDV camcorders, with the most popular models coming from established giants Sony, Canon, Panasonic, and JVC.

With the exception of the media each of the camcorders use, Digital8 and MiniDV are comparable technologies. Both formats use similar compression, signal processing, and digital transfer methods.

MicroMV provides the smallest DV camcorders to hit the market so far. Once again, you can find a proprietary Sony technology, MicroMV, for around $1,500 in early-market units such as the HandyCam DCR-IP55. An upcoming model, the DCR-IP5, boasts truly pocket-sized physical specs at 4 inches high x 3 1/8 inches wide x 1 7/8 inches deep and a total heft of just 12 ounces.

MicroMV uses MPEG-2 compression to record as much as an hour of digital video at resolutions of as many as 500 horizontal lines on a tape that is approximately 70% smaller than a MiniDV cassette. MicroMV also boasts a data transfer rate of 12Mbps (megabits per second); in real-world terms, this means you can scan a MicroMV tape to find the footage you want approximately 15 times faster than you can a MiniDV or Digital8 tape. MicroMV tapes also incorporate a 64KB memory chip and provide a function that indexes your clips for quick and easy retrieval.

One drawback to the MicroMV format has been its lack of compatibility with many popular video-editing programs. As far as we could determine at press time, only Sony's proprietary MovieShaker package and Ulead's Video Studio 7 (http://www.ulead.com) provided full support for MicroMV. Considering the buzz that's currently surrounding MicroMV, however, we expect this scenario to change before long.

But don't expect this article to be the final word on consumer DV formats. Development in the world of digital video doesn't exactly loiter. By the time this article sees print, be on the lookout for a new breed of DV camcorder from Sony, Panasonic, and Hitachi that uses rewriteable DVD-RAM media instead of tape. These models necessarily grow in size, but they provide true random access to your footage, eliminating the need to rewind or fast forward a linear tape. These cameras also promise to revolutionize the way you transfer your

Digital 8 Camcorders from Sony can cost slightly less than more popular MiniDV models.

footage from your camera to your PC. And you heard it here first: It won't be today, and it might not be tomorrow, but coming soon enough is the day you'll be able to slip your DVD-RAM out of your camcorder, pop it directly into your DVD player, and press the Play button to watch the day's footage.

Be Your Own Studio

The ability to edit digital video from the comfort of your own PC is one of the most persuasive arguments in favor of DV camcorders.

Before we get into the gear you'll need, we should note that a DV camcorder is not actually a required component in the setup. For a relatively modest outlay of about $70, you can feed analog video into your PC using products such as the Dazzle Digital Video Creator 80 (http://www.dazzle.com/products/dvc80.html). Such video capture devices connect to your PC via USB and supply all the inputs you need to patch in an analog camcorder, VCR, or even your television. Analog signals, however, need to be converted to digital signals on their way into your PC. If you transfer your edited footage back out to the camera or to a VCR deck, the signal must be converted back to analog again. This

copy-of-a-copy processing ultimately degrades the quality of the footage.

Digital video, on the other hand, requires no such conversion. You can also transfer digital data many times faster than analog.

The first thing you'll need is a FireWire (IEEE 1394) interface. All self-respecting DV camcorders include a FireWire terminal, and FireWire ports are becoming standard components on more and more new multimedia PCs. If your system isn't yet FireWire-equipped, you can still set yourself up for less than $60

Higher-priced "prosumer" digital camcorders offer high-end video in DV (digital video) format.

with products such as Orange Micro's OrangeLink FireWire PCI board (http://www.orangemicro.com/fwpci.html).

You'll also need some type of video editing software. There are many packages on the market. The range begins with basic, user-friendly products, such as Windows Movie Maker, which Microsoft includes with Windows XP. At the other end of the spectrum are can't-get-much-fuller-featured products, such as Adobe Premiere 6.5, which provides everything you need for professional post-production for about $550.

If you need both software and hardware, you can kill two birds with one credit card with a bundled product, such as the OrangeLink card mentioned above or Dazzle DV Editor SE (http://www.dazzle.com/products/DV-ESE.html). With either of these packages, your $60 gets you an internal PCI (Peripheral Component Interconnect) card with two FireWire ports and basic DV editing software to go with it.

Bear in mind that if you want to copy your DV footage of Cousin Steve's wedding to VHS tapes for the rest of the family to enjoy, you're still at the mercy of the digital-to-analog conversion process, not to mention the far lower resolution of VHS.

If you have a CD-R or DVD-R drive, many video editing programs let you burn your DV footage straight to a Video CD or DVD without ever leaving the digital domain.

All that's left between you and the local film festival are a couple users manuals and a learning curve.

Sony's new MicroMV format produces the smallest DV (digital video) camcorders to hit the market so far.

Things To Consider

If you are contemplating DV camcorders as a way of purchasing a video camera and a digital still photo camera in the same unit, your thinking isn't flawed. You should be aware, however, that all DV camcorders aren't created equally where still photos are concerned. The average entry-level DV camcorder incorporates a single CCD that captures about 680,000 pixels per inch. A snapshot taken with this type of camcorder won't compare favorably with so-called megapixel digital still cameras or even with the average snapshot taken on 35mm film. If you want a DV camcorder that produces good-quality photos in addition to high-resolution video, steer your shopping toward products such as the Canon Optura 200MC (1.33 megapixels for about $1,100) or Sony's HandyCam DCR-TRV80 (2 megapixels, plus Bluetooth wireless networking capability, for about $1,500).

If your Sunday ad supplement touts a digital camcorder for $199, look more closely. We notice that retailers still sometimes play fast and loose with terminology, and sometimes an analog camcorder with digital zoom capability turns up advertised as a digital camcorder. It isn't.

As far as zoom capability is concerned, we recommend looking at a camcorder's optical zoom rating rather than the digital zoom rating. Some camcorders handle digital zoom better than others, but the quality of the image always suffers. Optical zoom, usually 10X to 20X, is the most magnification your camcorder's lens and associated hardware can handle before the internal circuitry kicks in to approximate higher magnification levels. So far, we've never found the quality of a digital zoom mode to be used for much of anything but novelty.

Finally, when it comes to editing your DV home movies on your PC, the camcorder isn't the only factor in the equation. For best results, make sure your computer is capable. Video processing is extremely demanding of your PC's resources. Standard-quality video contains 30fps (frames per second); if your computer's processor or hard drive isn't fast enough, or if you don't have enough RAM, your system may drop frames when capturing video, degrading the end result. As a general rule, your hard drive ought to offer a spin rate of at least 7,200rpm (revolutions per minute). For efficient video processing, it also helps if you have at least 32MB of system RAM and 8MB of video RAM. ■

BY SEAN DOOLITTLE

© 2003 PriceGrabber.com Products/Trademarks shown are not in any way intended to indicate an affiliation or endorsement of PriceGrabber.com by their respective holders.

With hundreds of digital cameras to compare, you'll definitely find one that clicks.

If you're into digital photos or video, finding the right camera is no longer a shot in the dark. That's because PriceGrabber.com provides the fastest, most convenient way to locate and research the best products and prices online. Simply choose your criteria, click, and within moments you're comparing cameras by brand, features, popularity and price. While you're at it, get the lowdown on products and merchants from buyers just like you. Bottom line? Whether you're shopping for cameras, computers, TVs or thousands of other popular items, PriceGrabber provides all the information you need to make the best buying decisions.

PriceGrabber.com
Comparison Shopping Beyond Compare.™

Scan Your Way To Success

Digital Cameras May Be All The Rage, But Can They Do This?

So you missed the digital revolution. Your friends keep emailing pictures of their babies and pets, and you're stuck with a pile of aging Polaroids and prints. They're taking pictures with their fancy digital cameras that will last forever, and yours are slowly fading away in worn boxes and crusty albums.

Thanks to scanners, it doesn't have to be this way. These indispensable imaging devices have been around for decades, but in the past few years, the technology has evolved and the prices have fallen so quickly that even if you're on a strict budget, you can get the features and quality that even professionals could previously only dream about.

Scanners are designed for one thing: transferring physical pictures into a digital format for display and storage on a computer. There, you can catalog and permanently archive the pictures without any fear of degradation. You can also email, upload to Web pages and auction sites, and manipulate the pictures with photo-editing software that does everything from restoring color to removing scratches. All this functionality can be yours for $50 or less, but of course you get more features at higher price points.

Flatbed scanners, the most popular type, take pictures of pictures by smoothly moving an arm containing a light and photosensors across the underside of a glass plate. Light reflected off of the image or object on the other side of the glass plate is reflected back to the photosensors, which then translate the reflected colors into digital data that is woven together to create a digital image on the computer. Of course, there's a little more to it than that, and knowing how the scanner processes images can help make your scans more vibrant and accurate.

Optical Or Bust

When shopping for a scanner or sizing up the capabilities of the one you already own, there are a number of specifications to consider. The most important and most misunderstood is the scanner's dpi (dots per inch) or resolution rating. The dpi rating is the number of unique dots the photosensors can resolve per inch of scanned material. For example, a scanner with 600dpi can "see" 600 individual dots per inch, while a 300dpi scanner can only "see" half that much detail.

Many of the outrageously high dpi or resolution claims, such as 9,600dpi, you'll see on the side of scanner boxes, have nothing to do with the actual capabilities of the scanner hardware. The only thing you need to worry about is the scanner's optical resolution, which is the maximum number of horizontal and vertical dots the unit's photosensors can resolve. Consumer scanners typically have optical resolutions of 300dpi or 600dpi, although you'll see some scanners that offer higher optical resolutions such as 1,200dpi.

The dpi figures listed that are higher than the scanner's optical resolution result from the use of software interpolation technology. Interpolation artificially increases the size of an image by using algorithms that insert lines of artificially created pixels (picture elements) between lines of pixels that were actually scanned. The algorithms do a fair job of predicting the colors of these artificial pixels so they blend in with their neighbors, but interpolation always introduces a certain amount of fuzziness to an image. A scanner with an optical resolution of 600dpi that's set to scan at 9,600dpi using interpolation will create a gigantic image that looks out of focus. Avoid interpolation whenever possible.

The Scanner Spectrum

Color bit depth is the other major specification to look out for; it determines how many colors the scanner can capture. This figure is always measured in bits, such as 8-bit, 16-bit, etc., with colors increasing exponentially as the numbers go up. For example, an 8-bit scanner captures a maximum of two to the eighth power, or 256 different colors, and a 24-bit scanner captures two to the 24th power, or 16.7 million different colors.

Many modern scanners are advertised with 48-bit color, but that number sometimes is misleading. Many 48-bit scanners actually capture 24-bit or 32-bit color, and the extra bits are used to capture a smoother range of grayscale information to improve shadow detail. Regardless of the color bit depth your scanner supports, it's usually best to scan using the highest possible value. Doing so captures the most detail, and you can always reduce the colors later using image-editing software. This obviously applies only to color images. Use grayscale mode for scanning black and white pictures or line-art mode for scanning images that truly are black and white, such as sheets of text or newspaper cartoons.

Tips & Tricks

Making a scan usually isn't as easy as slapping an image on the glass plate and pushing a button. Scanners come with software that lets users make some basic adjustments before scanning an image. This software varies from manufacturer to manufacturer, and the interfaces may differ slightly, but most scanner software offers the same basic features.

First, you must use an external program, such as a graphics editor or a word processor, to activate the scanner software. You'll generally find this option on the File menu in applications that support scanning, within the Acquire or Import menu. Use the scanner software to create a quick preview scan if it is not done automatically. This is a fast, low-resolution sweep of the entire scanner surface that shows how the image or object on the scanner is aligned. If your scanner software doesn't perform a preview scan automatically, look for a button or menu entry that creates one.

The histogram tool offers fine control over contrast and brightness, but not all scanner software offers this option.

The dashed lines around the magazine cover tell us that it is the only thing that will be scanned.

Once the preview scan is finished, you'll have many options to make sure the final scan comes out just right. The selection tool is usually the most useful, and when it's selected you can draw a square, circle, or other shape around any portion of the previewed scanner bed. When the final scan is created, it includes only the selected area in the scan. This cuts down on file sizes and cuts a few steps out of the final editing process once you've loaded the scanned image on the computer.

Dashed lines mark the selection area, and other tools may be available that let you easily add to a selected area, subtract from it, or otherwise change its shape. There's usually a zoom tool, as well, which lets you magnify a portion of the overall scan to fine-tune the selection area.

Once you've made a selection, you can use other tools to adjust the color, contrast, resolution, and other aspects of the final scan. Some scanner software lets you select the type of image being scanned, be it a color photograph, line art, a text page, or something else. Make the proper choice or use the automatic setting if it's available and you're not sure what to do.

If the preview scan shows the image is misaligned, rotated, or upside down, it's best to reposition the picture on the scanner bed and redo the preview scan. With many scanner applications, you can rotate, flip, or otherwise change the alignment using software so the final scan is straight up and down. Every time you use software to fix an image, however, the final scan's quality degrades slightly.

Controlling colors and contrast is another matter entirely. It's usually better to use the scanner to handle this problem as the scan is being made rather than create a bad scan and then try to fix it using an image editor. Use the contrast and brightness controls (if available) to bring out the colors and black levels in the preview scan. Some scanner software can automatically set these values, and if you're really lucky, the software has a histogram, which looks like a bar chart with three arrowheads on a slider bar below it. Slide these arrows left and right to adjust input and output levels, although mastering this tool takes some practice.

If there's an option to adjust the speed of the scan, use the slower settings for best quality and the faster settings for quick scans that don't need to look quite as good. Unless you make a lot of scans, we recommend using the Slow or Quality setting and taking the extra time to create a sharp scan.

You'll hear a lot of fuss about dpi settings; some people recommend using low settings (70dpi to 150dpi) when scanning images intended for the Web and higher settings (300dpi or more) if you plan to print the final scan on a quality printer. The 70dpi to 150dpi figure also is used a lot because those settings provide scans that are approximately the same size as the original picture when viewed on a computer monitor at standard resolutions. We recommend you scan using at least 300dpi and then scale the image down to whatever size you need using a third-party graphics editor. That way you can always print the scan later without having to rescan to capture detail that was lost, but you don't lose much detail (if any) when you scrunch the image to a smaller size for Web use or emailing.

Use higher settings, such as 600dpi, if you need to create a blow-up of a picture or want to crop out a portion of a larger scanner image. Use very high settings, such as 1,200dpi, for scanning slides, which you can blow up to very large sizes without losing detail. Using 1,200dpi to scan photographs or other large images results in enormous, unwieldy files that you usually have to scale down before using.

Understand Image Formats

By default, scanners capture images in an uncompressed format called a bit map (indicated by the extension .BMP). These types of images maintain the greatest amount of detail and color purity, but take up loads of space on a hard drive. Fortunately, there are many compressed image formats in case you want to convert bit maps into files that take up less space.

There are two types of compression: lossy and lossless. Lossy compression discards redundant or otherwise unnecessary visual data in an image, slightly degrading its overall quality while packing it into a small space. Lossless compression isn't as efficient in terms of storage, but maintains the original image quality. JPEG (Joint Photographic Experts Group; indicated by the extension .JPG) is the most popular lossy format for color images because Web browsers can display JPEG files without special plug-ins. Using an image editor, we were able to convert a 721KB BMP file into a high-quality 85KB JPEG file with no appreciable loss in quality.

Can you tell the difference? The TIFF (Tagged Image File Format) on the left is 822KB, while the high-quality JPEG (Joint Photographic Experts Group) on the right is only 62KB, despite the fact that it has the same physical dimensions.

The most popular lossless compressed format is TIFF (Tagged Image File Format; indicated by a .TIF extension), but it's not nearly as efficient as JPEG for compression. The same 721KB BMP file compressed to 636KB when we converted it to a TIF, but the amount of compression depends entirely on the type of file you're compressing. Pictures with large blocks of solid color compress to very small sizes with TIF, but complex pictures with lots of color gradations (think sunsets) don't compress well.

Scanning Projects

Scanners can't match digital cameras for certain tasks, but there are a few tricks normally associated with cameras that a scanner can pull off in a pinch. Taking pictures of objects that you want to post at online auction sites is one of them. Simply place the object you want to sell on the scanner bed (be careful to not scratch the glass plate) and scan away.

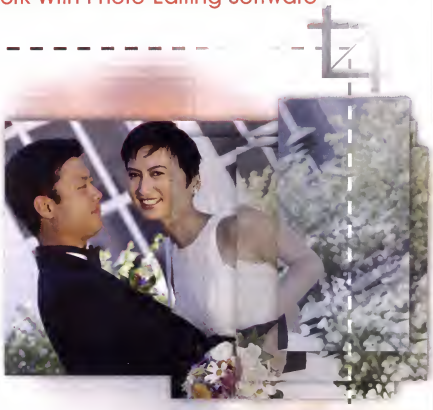
If you also have a printer connected to the PC, use the scanner with the printer to create a poor man's photocopier. Scan a document, resize it in an image editor so it will fill a printed page, and print it. You can also take the easy way out and install software that automates the process, assuming the scanner doesn't have such software already. Look for packages such as Neogie Software's free SimpleCopier (http://www.neogie.com/simplecopier) and Nico Cuppen's Photocopier (free basic version, $18 Pro version; http://www.nicocuppen.com). If you have a fax-modem installed, using it in conjunction with a scanner is a great way to fax documents.

These are just a few of the things you can accomplish with a scanner, and with the help of a good image-editing program, the possibilities are endless. Create personalized greeting cards, scan old family photos to remove scratches and restore color, make digital copies of important documents, and let your imagination run wild. Even the cheapest scanners are capable of creating great images, so find one within your budget and revel in the possibilities. ❚❚

BY TRACY BAKER

Image Editing 101

Work With Photo-Editing Software



EDITING YOUR PICTURES is one of the more fascinating and entertaining things you can do with your PC. Many of us love taking pictures, but most of us experience disappointment when we see the prints. With a good photo-editing tool, you can make your pictures come much closer to the way you saw them in the viewfinder, rather than the way the camera lens saw them. Our eyes are part of an interpretive system that lets us filter detail and focus our attention, while the camera is simply a recording device. Photo-editing software helps us humanize the picture-taking process.

There's no shortage of good, usable, and effective photo-editing software on the market. The "Image-Editing Contenders" sidebar looks at several inexpensive packages. For the professional, the standard is Adobe's famous Photoshop, now in version 7.0, but at more than $500, it's overkill for most of us. For that reason, we worked with one of the others to demonstrate the capabilities of a sub-$100 product. Although any of them would have sufficed, Jasc's Paint Shop Pro 8 got the nod because it was new, in late beta at press time. Here, we'll abbreviate it as PSP.

For all packages, however, the photo-editing process is similar. Launch the program, open the photo file in the desired file format, and scan the menus for the action you want to perform. In general, you'll find three types of features. The first features let you work with the physical details: size, position, and orientation and borders. The second let you "correct" the photo's appearance: brightness, contrast, and color. The third let you apply effects to your photograph that range from sharpening the focus to turning it into a psychedelic art form.

Before doing anything to your photo, however, save the file under a different name. That way, you can turn back to the original. In fact, if you're working with a folder full of photos, make a copy of the folder elsewhere on your hard drive and work with the copies, leaving the originals intact. All photo-editing programs offer numerous levels of undo, but accidentally clicking the Save button can render your original useless.

Automatic Improvements

We'll start with the easiest, most effective edit: automatic adjustments. In PSP, automatic adjustments appear on the Adjust menu, with three features: Color Balance, Brightness and Contrast, and Hue and Saturation. Most have an automatic mode in their submenus. When you select any of these features, PSP presents you with a dialog box that shows before and after pictures; the photograph currently loaded in memory appears on the left, and as you make adjustments, the results appear on the right. You can continue to adjust until the moment you commit to the changes by clicking OK.

For example, Figure 1 on page 69 shows a digital photo of Portia the cat. Portia looks a bit washed out, and her colors blend into the too-dark background. Under the figure are the PSP's three dialog boxes for automatic adjustment. Each adjusts the photo in a different way, and each is highly customizable. The Automatic Saturation Enhancement dialog box lets you select an option for skin tones, for example (not an issue with the cat, of course), and gives you a choice of the strength of the enhancement: Weak, Normal, or Strong. Clicking any of the options in any of the dialog boxes changes the "after" picture, and you can zoom in and out to see the effect at different distances.

But almost buried in PSP's interface is a feature that adjusts all three at

once. Clicking the Enhance Photo button lets you access One Step Photo Fix, which adjusts color balance, brightness and contrast, and hue and saturation as the program sees fit, without any interaction on your part. This may sound like a disaster waiting to happen, but the results were surprisingly good. No matter the quality of the photo, give One Step Photo Fix a try. At the very least, you'll get some ideas for your own edits because you'll see the photo in a different perspective. We applied the One Step Photo Fix to the cat picture and thought the improvement was remarkable. The photo is brighter, richer, and more colorful.

Typical Enhancements

Although your photo software has scores of editing features, you'll likely find yourself returning frequently to only a few of them. Typically, people edit photos so that they look more natural, not more abstract or playful. The enhancements we mention below show how to perform a typical set of tasks for effective editing, with some typical special effects tossed in for good measure. But as always, explore your software to understand the full range of possibilities.

Contrast and brightness. Brightness refers to the overall lightness of the picture, while contrast refers to the range between the light and dark areas. The trick to enhancing pictures is to adjust the balance among shadows (dark areas), highlights (light areas), and midtones. In PSP, you can adjust contrast and brightness together using the Contrast/Brightness dialog box. If you prefer, or in addition to this dialog box, you can use the Highlight/Midtone/Shadow dialog box to balance these three values precisely. Or you can use the Automatic Contrast Adjustment.

Color. Adjust color to make your photograph look the way your eyes remember it. Photo-editing software allows numerous color adjustments; PSP is no exception. First, you can adjust the color balance according to the strength and warmth you desire, by working with the settings on the Automatic Color Balance dialog box. You can also adjust the colors yourself with the Manual Color Correction dialog box, available from the Color Balance submenu. Once you're satisfied, use the Hue And Saturation submenu to experiment with the color saturation of your photo. Color saturation refers to the richness and vividness of the colors, and you can saturate or desaturate depending on how you want the picture to appear. To see how color saturation works, examine magazine and TV ads: Typically, ads are heavily saturated, so that colors seem almost beyond lifelike. Whites are whiter, reds are redder, and

Image-Editing Contenders

Adobe's Photoshop has long set the standard in image-editing software, but its $500+ price tag makes it impractical for casual use. Assuming you have $100 or less to spend, we've listed useful, richly featured products.

These products differ little in actual use. The principles are much the same across the field; the differences lie primarily in the grouping of features and the design of dialog boxes. All of the packages emphasize usability, with numerous features for automatically applying commonly used editing tasks. All products, in addition, produce edited photographs of a consistently high quality, no matter which enhancements and effects you choose. This table offers a quick comparison.

Product	Price/MSRP	Special Features	Overall Value
Paint Shop Pro 8 Jasc Software http://www.jasc.com	$109 ($99 download)	Macro scripting capabilities let users record commonly used tasks; interface is completely customizable. User learning is enhanced through integrated videos showing various tasks; well designed dialog boxes.	Very good. The most expensive of the packages here, but its feature set, strong usability, and scripting take it an extra step toward the professional realm of image editing.
PhotoImpact 8 Ulead Systems http://www.ulead.com	$89.95 ($79.95 download)	Edit multiple photos with batch processing; very nice drawing tools, and Web publishing tools; includes GIF animation; bonus content CD with excellent selection of photos and animations.	Very good. Pricier than PhotoSuite 5 but with many strong features; save $30 with competitive upgrade.
Adobe Photoshop Elements 2 Adobe Systems http://www.adobe.com	$99	Excellent import capabilities from scanners and digital cameras; strong ability to blend photos in panoramas; Quick Fix dialog box works exceptionally well; good introduction to Photoshop product line and community.	Good to very good, especially with its tie-in to Photoshop, but it's more expensive than two others without offering more features.
PhotoSuite 5 Platinum Edition Roxio http://www.roxio.com	$49.95	PhotoDoctor features strong automatic photo repairs; ability to quickly stitch photos together; edit multiple photos simultaneously; project templates for adding photos to invitations, calendars, etc.; detailed photo organizing features.	Excellent, especially at this price; includes $20 rebate for competitive upgrade

lush green grass is greener than anything your lawn will ever have.

Red-eye. Red-eye is what its name suggests: the people or animals in your picture have red eyes. Assuming you don't want this effect (it's useful if, for example, you're trying to show your boss is demonic), you can get rid of the red eyes using your software's red-eye removal feature. In PSP, you'll find the feature in the Adjust menu, and selecting it yields the Red-Eye Removal dialog box. This dialog box has two default settings, but you can choose from numerous settings. You can set the eye color (aqua, blue, brown, violet, grey, and green), and the iris size. You can add a glint to the center of the eye, and you can increase or decrease the lightness of the pupil. You can outline the pupil in a freehand or point-to-point manner. You don't just remove the red-eye; you can redesign the eye to look the way you want.

Crop. One of the mistakes casual photographers make is standing too far away from the subject. The result is too little subject, too much background. You can get rid of unnecessary background in your photo-editing program by using its Crop tool. Typically, this is a two-step process in which you first outline the area you want to keep and then crop away the remainder. In PSP, start by clicking the Selection tool on the Tools bar and dragging the rectangle over the image to outline the area you wish to keep. When you release the mouse button and are satisfied with the selection, click Crop To Selection from the Image menu. Only the outlined area will remain. The picture is now more focused on the subject, and it's smaller and therefore more suitable for sending by email or posting to Web sites.

PSP actually includes three selection tools, of which the most interesting is the Magic Wand. Select this tool from the drop-down menu beside the rectangle on the Tools bar and click anywhere on the photograph. The tool will select a shape that surrounds the point you just selected. For example, it will select a white cloud in a blue sky.

Figure 1

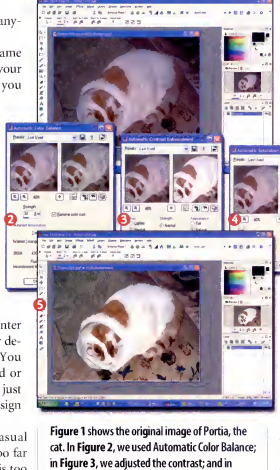


Figure 1 shows the original image of Portia, the cat. In Figure 2, we used Automatic Color Balance; in Figure 3, we adjusted the contrast; and in Figure 4, we used Automatic Saturation Enhancement to enrich the colors. Figure 5 shows the image after we applied One Step Photo Fix.

Repair Prints

With a good scanner and your photo-editing software, you can revitalize all of those prints you've accumulated over the years: wedding pictures, graduation pictures, and those endless pictures of your kids, pets, and vacations. After removing any red-eye the flash caused, the next step is to fix the damage caused by scratches and creases. PSP's scratch removal tool is located on the Tools bar, but instead of being named separately, it's part of the Clone Brush feature. Click the arrow beside the Clone Brush tool and select the Scratch Remover from the menu. Doing this reveals the scratch removal toolbar, placed above the picture, from which you can choose the shape and width of the selector. Drag the tool over the scratch and release. The tool attempts to clone the surrounding background and overwrite the area of the scratch; you'll have to experiment to get the results you want.

The Clone Tool also helps you effect repairs; it captures the area of the picture over which you drag the tool, turning it into a paintbrush with which you can "paint" the captured area over damaged sections of the image. It's a difficult tool to use for this purpose, but because it allows a great degree of precision (its automatically appearing toolbar offers options ranging from density and thickness to the level of opacity), it can be useful for correcting both backgrounds and foregrounds.

Once you've removed the scratches and creases, you can use the rest of PSP's features, particularly contrast and color settings, sharpening and softening, and photo cropping, to give the photo the quality it deserves. One especially useful feature is Fade Correction, which corrects color and contrast in one step. For older prints that have faded over the years because of exposure to light, Fade Correction can make all the difference.

Special Effects

Effects are fun. You can use them to enhance realism, but usually they yield a photograph that looks creative, artistic, or even bizarre. We experimented with PSP's Effects menu, with its wide array of effect types: 3D, Art Media, Artistic, Distortion, Edge, Geometric, Illumination, Image, Reflection, and Texture.

Save an original of your photo to a separate folder and try all of the tools in your program. Photo-editing is a learn-by-doing experience. ■

BY NEIL RANDALL

Output Is King

A Printer Primer

No PC's complete without a printer, but choosing the right one is tough. Determine what you'll be doing with your printer and what you can afford. More importantly, figure out how much it'll cost you to print, factoring in costs per page. You'll find that although inkjet printers are inexpensive to buy, the short life of the cartridges renders the overall cost of printing quite high. If you need to print hundreds of text pages in a year, a laser printer may cost less in the long run. More than any other PC peripheral, consider your printer an ongoing expense rather than a one-time expense.

Even so, printers prices keep coming down; you can find a good, reliable inkjet printer for less than $100. Laser printers have cracked the $200 barrier, and even color lasers are available for less than $1,000. It makes sense to own more than one printer, letting each one perform the tasks it does best.

We'll take a look at the types of printers on the market, how they work, and the typical tasks for which each is best suited. All these devices here come under the category of "nonimpact" printers, as opposed to the dot-matrix and daisy-wheel "impact" printers that once dominated the PC market.

Inkjet Printers

Inkjet printers spray small drops of ink onto the paper through a series of nozzles in the print head. Because the print heads issue ink only on areas demanded by the printer driver (which in turn receives its instructions from the PC), the primary printing technology is drop on demand. This method relies on a simple heating system. The printer heats the ink until it creates a bubble, which, under pressure from the heat, eventually bursts. The burst sends the ink onto the paper, and the resulting vacuum draws more ink from the cartridge into the nozzle. This is known as the bubble jet method.

Another method, piezo-electric, is proprietary to Epson printers. Piezo crystals reside at the back of each nozzle's ink reservoir. When the image requires a drop of ink, the printer applies current to the crystal. The crystal vibrates, creating pressure and expanding it, thereby forcing the drop of ink out of the nozzle. As the current is removed and the crystal stops vibrating, it draws more ink from the reservoir.

Inkjet printers are versatile. They print clear, legible text, often indistinguishable to the naked eye from laser-printed text, and color prints are bright and rich. To get the best color prints, you'll need thicker, less porous paper than the standard printer paper, but if you need the color, it's worth the cost. Because of this versatility, an inkjet is a perfect printer if you have kids in school or for your community organization's posters and newsletters. You can also print your photos with them, typically using higher priced photo paper, and indeed the products called "photo printers" are almost exclusively inkjets.

Because of the low cost, inkjet printers are popular and plentiful. Computer manufacturers frequently include an inkjet printer as part of a new PC bundle. But if you print frequently, you'll find that an inkjet costs quite a bit to operate. Cartridges frequently sell for $15 to $50, with color printers frequently needing two cartridges: one for black ink and one more expensive for colors. Typically, cartridges only last for a few hundred copies, and the long-term expense becomes obvious. Furthermore, if you don't use an inkjet printer for an extended period, the cartridges can dry out, so you'll have to buy replacements.

Inkjets have one other disadvantage: They're slow.

Laser Printers

Laser printers operate through electrophotography, the same process photocopiers use. At the core of this process is static electricity. The printer's circuitry captures the image sent from the computer and transforms it into a bit map, one page in size. The printer uses a low-power laser to "draw" this image on a revolving drum, to which it has already applied a positive charge. The

function of the laser is to place a negative charge on the points where the image is to be applied.

The printer applies a coat of fine powder, called toner, to the drum, and the toner has a positive charge. Because opposite charges attract, the toner will stick to the areas that carry a negative charge. The printer then rolls the paper through a heat system that melts the toner, letting it fuse with the fibers on the paper, all in a matter of seconds.

Laser printers cost more than inkjets, but the initial cost is offset by a reduced cost in the long term. Lasers are durable. The cartridges are also more expensive than inkjet cartridges (expect to pay $60 to $100 for a toner cartridge), but it will last for 3,000 pages or more. Many lasers have a built-in toner-saving mode, which renders text less dark but results in an even longer-lasting cartridge. Further, lasers print well on most paper you slip in, as well as on transparencies and other specialty types of media.

If you print large text documents, or numerous black and white documents, get a laser. They're faster than inkjets, and they offer better quality prints with no ink smudging and fewer paper jams.

Dye-Sublimation Printers

If you want the best possible printouts of your digital photographs, look into a dye-sublimation (dye-sub) printer. Also called dye diffusion thermal transfer printers, these devices operate by sublimating the dyes, causing them to turn to vapor and then back into solids. The printer heats the dyes contained on special films so they vaporize and permeate the treated paper, then turn off the heat so the dyes cool on the paper, creating the image.

Dye-sub printers produce better colors than inkjet printers because they create actual colors instead of dithered colors. Inkjets create color by spraying tiny drops of ink next to each other in a pattern that looks to the human eye like the desired color. The colors are merely perceived rather than actual, and colors are only in place after the fact. Dye-sub printers mix the dyes before applying them to the paper; the paper itself is engineered to help our eyes see the difference. Because the colors are not applied as small dots, the borders between the colors blend more naturally, creating a smoother appearance. Known as continuous tone, this technology helps the image appear more natural.

Printers need maintenance to continue working at their peak, and you can perform tests using the Properties dialog for your printer in Windows.

Dye-sub printers are superb for photographs, but they have a few downsides. First, they tend to be more expensive than color inkjets. Second, they specialize in smaller printouts; the Sony DPP-EX5 Digital Photo Printer, for example, prints only 4- x 6-inch or 3 x 5 sizes. Third, the paper is expensive because it's created specifically for dye sublimation. Fourth, these printers are impractical for printing 8.5 x 11 sheets with black text, which is what most PC users print.

Once you understand the different print technologies, it's easy to see how monochrome (black and white) printing works. Color is a different matter; the printer takes the colors you see on your monitor or in your digital camera or original document and transforms them onto the paper.

The first stage in color reproduction is color matching. The colors on the printer must match the colors on the monitor, which is difficult. Your monitor creates color by mixing RGB (red, green, and blue) light sources. Your printer creates color by absorbing white light into CMY (cyan, magenta, and yellow) inks or toners. Printer drivers and control software handle the translation between the two systems.

Color inkjet printers were once available only as three-color systems, with a single cartridge containing cyan, magenta, and yellow ink reservoirs. They created colors by combining the three inks into differently colored drops, as required by the image they were reproducing. The two problems with this system were the inability to produce a true black (you ended up with a kind of dark gray or green known as composite black) and the inefficiency given that most people primarily print black and white (text) documents.

Manufacturers added a fourth ink color: black. The result was the CMYK color system, "K" being black (as "B" was already assigned to Blue). Printer manufacturers started including a black cartridge in addition to the color cartridge, asking you to swap the cartridges depending on the document you were printing. Swapping cartridges is inconvenient, so the next step became two cartridge units inside the printer, one black and one CMY, with the user specifying which one the printer was to use.

This remains the predominant system in color inkjet printers, although six-color printers have appeared, as well. These printers add a light magenta and a light cyan for additional assistance with color transitions. Eight-color printers are also available, with orange and green for additional printing possibilities.

Color lasers, once out of the price range of anyone who actually had to eat and pay rent, have decreased in price; a few models are available for less than $1,000. From a color-creation standpoint, color lasers work like color inkjets, although the printing technology (drum, toner, and laser) is much different. The color laser produces color by performing the printing process once for each color (four times, for instance, in a CMYK system) applying the various toners in the amounts necessary to create the colors demanded. Depending on the model, the printer might apply each color to the paper separately, in four passes, or apply all the toner to the drum and then to the paper. Higher-end color lasers can use a full printing system, complete with separate drums for each color, passing the paper through each one and applying the colors individually.

Where To From Here?

Printers keep getting better. No matter how many strides we make toward eliminating the need for printers (storing your photos on DVDs and showing them on your television, for instance), as a culture we love paper. Paper is convenient: You can carry it and look at printed photos while sitting on a bench in a park. The tactile pleasure that comes from handling paper and prints is the pleasure that many commentators say will keep magazines and books on the market even if ereaders become widely available. Printer and paper manufacturers know that pleasure very well, and they'll keep us turning to it as long as possible. ■

BY NEIL RANDALL

Perfect Photos, Perfect Prints

You have many ways to show people your photos (on your PC, on the Web, on your TV screen through your DVD player), but most of us go back to what we've always used, the print. Today, however, you don't have to rely on the photo lab; you can print photos yourself.

Resolution. To get good prints, you need to understand **resolution**, the sharpness and clarity of the image. There are three resolutions to understand (printer, monitor, and image) and the computer industry expresses all three differently.

Your printer's resolutions are expressed as dpi (dots per inch). Laser printers typically print at 600dpi, and color inkjet resolutions at 2,400dpi or higher. A resolution of 600dpi means 600 dots per linear inch; if your print is 6 inches wide, your printer will print 3,600 dots across the page. Technically, though, 600dpi should be expressed as 600 x 600 dpi, meaning that the printer provides 600 dots per linear inch both horizontally and vertically. Color inkjets often bear different horizontal and vertical dpi ratings (4,800 x 1,200 dpi, for example), which means its dots are more tightly packed in a horizontal inch than a vertical inch. A single-number dpi rating means that the horizontal and vertical inches receive the same number of dots.

Monitors resolution is expressed by two numbers, the first representing the number of pixels and the second the number of lines. A resolution of 1,024 x 768 means that the monitor displays 1,024 dots on each of the 768 lines available from screen top to bottom. When you decrease the resolution to 800 x 600, you spread the image out, telling the monitor to use only 800 pixels per line and only 600 lines from top to bottom. The result is a larger image, although one with less tightly packed dots.

Images have resolutions, measured in pixels per inch. The idea is the same as printers: a specific number of dots both horizontally and vertically. Problems develop, though, when attempting to print the image onto paper. If your image has a resolution of 600 x 480, it contains 307,200 pixels. If you print this as an image 1 inch high by 1 inch wide, no problem. But if you try to print it as a 7-inch x 5-inch glossy (a typical photo print size), you're telling your printer to stretch the 600 pixels across 7 inches and the 480 pixels across 5 inches. Too much space between the pixels, results in a severely pixelated image. You'll have better luck if you capture your image at a higher resolution, such as 1,600 x 1,200, and then print to your page.

Paper quality. You don't want your best and most important photos printed on a lousy printer with cheap paper. Depending on the task, you can access paper according to numerous characteristics, but two of the most common are brightness and whiteness (also known as white point). **Brightness** refers to the ability of the paper to reflect light off its surface, with stronger reflectiveness resulting in more vivid colors. **White point** refers to the contrast between the toner and the paper. Whiter paper is not necessarily brighter paper.

Texture is also an important characteristic. The smoother the paper, from a tactile standpoint, the smoother the print, but smooth paper can also be difficult to feed through a printer and can result in easier ink smudging. Textured papers, however, can be aesthetically pleasing. Paper is also characterized by weight, ranging from 20-pound paper (standard copier/printer paper) through 32-pound paper (brochures) and higher, and by **opacity**, the ability of the paper to block ink/toner from showing, in any way, on the reverse side. ■

Glossary Of Terms

aperture—In reference to cameras, the aperture is an opening at the front of the camera that determines the amount of light that will pass through the lens to fall on the image sensor, which is used to record an image. The aperture is measured with a term known as the f-stop. The wider the f-stop setting, such as f1.4, the more light that passes through the lens. The more narrow the setting, such as f11, the less light that passes through. With aperture, a higher f-stop number (f8, f11, etc.) actually indicates a smaller opening, and thus less light.

autofocus—Refers to how a digital camera's lens focuses on an object. A camera with an auto focus lens focuses specifically on a certain object, making it the finest detailed object in the picture. In comparison, a digital camera with a fixed-focus lens focuses on everything from a few feet to an arbitrary distance.

color bit depth—The number of different colors a piece of software or hardware can display. This amount is tied to the number of bits used for each pixel. For example, a device that uses 16 bits per pixel (such as a 16-bit video adapter) can show 2 to the 16th power (about 16.7 million) colors.

compression—Storing a file in such a way as to reduce its size. This is generally done by eliminating redundant information in such a way that the information can later be reconstructed. Compression is used to put larger files into smaller spaces (to fit on a floppy diskette) or to fit a greater number of files on a hard drive. It's also particularly handy for reducing file and image sizes so they can be uploaded or downloaded more quickly.

driver—A program that lets a hardware peripheral, known as a device, communicate with a computer. Device drivers typically come with the device, and updated drivers can be obtained through the manufacturer's Web site.

electrophotography—A technology that combines elements of photography with electricity to reproduce images in printers and photocopiers. A negative image is created on an electrostatically charged drum. Where the light (from sources such as lasers or LEDs [light-emitting diodes]) comes through, the drum carries no charge. Powdery toner sticks to the charged areas of the drum and is transferred to paper, where it adheres due to pressure and heat. Laser printers, LCD (liquid-crystal display) printers, and LED printers use electrophotographic means to re-create images on paper.

histogram—In statistics, a histogram is a kind of bar graph that shows the distribution of data. It comes from the Greek words *histos*, meaning "pole" or "mast," and *gram*, meaning "chart" or "graph," and a histogram is also sometimes known as a pole chart. You will frequently see histograms in use in the computing field. Graphics programs, for example, use histograms to show how pixels are distributed in an image and therefore reveal the amount of detail in different areas of the image. In practical terms, this helps a graphic artist determine if she needs to clean up an area in shadows or if the highlights are too prominent in order to make a balanced image. This is sometimes called histogram equalization.

interface—A communication link in a computer between hardware and software components. A user interface is the way a user communicates with a computer or other pieces of hardware or software. As a verb, to interface is to communicate.

interpolation—Refers to the use of software to enhance the true resolution of a digital image and is often used with digital cameras and scanners. Through interpolation, the software copies pixels and pastes them among existing pixels to enhance the image's resolution.

PCI (Peripheral Component Interconnect)—The Intel local bus standard that allows for faster communication between a PC's CPU (central processing unit) and peripheral components, thus speeding up operating time. Most PCI buses coexist on a motherboard with an ISA (Industry Standard Architecture) or EISA (Extended Industry Standard Architecture) bus, so the user can plug in expansion cards compatible with either standard. An advantage to the PCI bus is its Plug-and-Play capability, which means it can help an operating system detect and configure new cards when they are placed in a PCI slot.

zoom lens—A specific type of lens on a digital camera that is able to change its focal length to close in on a subject to a certain degree, with the effect of enlarging the subject in the image. Typically, the zooming ability of the lens is referred to in terms of X, such as a 2X or 3X zoom lens. The zooming ability of a lens is typically controlled using a button or lever.

Give *your* car the luxury of satellite navigation.

© 2003 Garmin Ltd. or its subsidiaries

The StreetPilot® III from Garmin has features found in expensive in-dash navigation systems, plus one very important quality the others don't have. StreetPilot III is portable, so you can have the best in GPS navigation in any car you drive. Look up addresses, attractions and other services, and StreetPilot III will create a route and provide turn-by-turn directions with voice prompts to get you there.

StreetPilot III and GPS V from Garmin. Navigation for every car.

GARMIN. www.garmin.com NASDAQ **GRMN**

Available at: BEST BUY CompUSA

PC Project:

Old Time Rock 'N' Roll Made New

Copy Your LPs Or Cassettes To CDs

Your music collection spans the majority of your lifetime, and if you're at all nostalgic, you still have LPs, cassettes, and the necessary stereo equipment to play these gems.

However, you can't take LPs with you on the go, and portable CD players and MP3 players have pretty much replaced portable cassette players. In addition, neither LPs nor cassettes are very durable. LPs tend to scratch and easily break, while the insides of cassettes are vulnerable. We've all seen cassettes in the trash with the tape pulled out.

So what do you do you do about the music on your old LPs and cassettes? Updating your collection with CD replacements is cost prohibitive and even then, you may not find your old favorites on CD. What you need to do is hook up your stereo equipment to your PC and record your LPs and cassettes to your hard drive. Once the music is on your computer, you can tweak the sound quality and burn the files to CD.

What you need to do is hook up your stereo equipment to your PC and record your LPs and cassettes to your hard drive.

Before You Record

The process of moving your music collection to CD requires both hardware and software. Following is an overview of what you need.

Hardware. To transfer your LPs, you'll need a record player and a preamplifier, which boosts and equalizes the LP's signal. Without a preamp, the LP's signal is too weak for recording. Most stereo receivers contain a preamp, so connecting your LP to your receiver's Phono jacks should work just fine. To transfer cassettes, you need a cassette player. No matter what you're transferring, you'll need a cable with two RCA plugs on one end and a 1/8-inch mini stereo plug on the other end. This cable lets you hook up your stereo equipment to your computer. You'll plug the RCA plugs into the player's (or preamp's) output jacks and the mini stereo plug goes into your sound card's Line-in jack.

It's important to have plenty of free hard drive space, especially when you consider that one minute of music takes up approximately 10MB of storage space. To record one LP (roughly 40 minutes), you'll need about 500MB. Your sound card is also important because it's responsible for capturing the music. It must convert the analog audio signal it receives to digital, typically a WAV file, and to achieve CD quality sampling, it must capture at a frequency of 44.1KHz (44,100 samples per second). In addition to the frequency, the sound card must record in stereo at a 16-bit resolution, which is the measurement of the precision with which the samples are measured.

Software. You'll need software: a recorder, audio-editor, and CD burner. You can use separate software titles for each task or invest in an audio recording suite. You may already have some of these on your PC, but there are other titles you might want to consider.

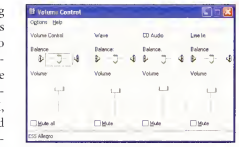
Windows has a built-in recording utility called Sound Recorder. This utility works well for simple audio tasks, but it isn't well suited for heavy-duty audio recording. When you use Sound Recorder, the audio information is recorded to your system's RAM, and it isn't transferred to your hard drive until recording is finished; therefore, your recording time is limited to the amount of memory you have. To access Sound Recorder in Windows XP, go to Start, All Programs, Accessories, and Entertainment and then select Sound Recorder.

If you have a CD-RW (CD-rewriteable) drive, you probably already have CD-burning software, such as Roxio's Easy CD Creator or Ahead Software's Nero Burning ROM. Many CD-burning packages let you record from external devices, as well as edit audio. For example, Easy CD Creator includes a utility called Spin Doctor, which is designed to capture and edit audio tracks. Your sound card may also have recording and editing capabilities. For example, I used a Creative Labs SoundBlaster Audigy sound card, and with it, I could easily pull music from my LPs and cassettes.

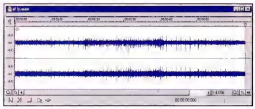
Other software packages that focus on recording and editing audio tracks include Sonic Foundry SoundForge 6.0 ($499.95; http://www.sonicfoundry.com), Syntrillium CoolEdit 2000 or CoolEdit Pro ($69/$249; http://www.cooledit.com), and MAGIX Music Studio 7 or Deluxe ($49.99/$99.99; http://www.magix.com).

Push Play

Before actually recording, adjust and enable the appropriate volume levels using Windows' Volume Control. To access Volume Control in WinXP, double-click the Volume icon in the System Tray or go to Start, All Programs, Accessories, and Entertainment and select Volume Control. Listen to something at the current volume levels and adjust the Master volume, so it isn't too high or low for your tastes. Next, make sure you have options for Line In and Wave volumes. If not, select Properties from the Options menu. In the Properties dialog box, under the Show The Following Volume Controls section, place a check mark next to both and click OK. Back in the Volume Control dialog box, make sure the Line In and Wave volumes aren't muted and adjust the volume to a level that you're comfortable with.



Before recording, access Windows' Volume Control to adjust the appropriate volume levels.


Record, play back, and edit audio with SoundForge 6.0.

Record. With your volume set, open the recording program. You can record the entire LP or cassette into one WAV file or record each track separately. If you record one file, you can separate the tracks after you've cleaned them.

I recorded tracks with my sound card's Creative Recorder feature, and the Record function in CoolEdit 2000, SoundForge 6.0, and Audio Studio 7 (part of Music Studio 7). One of the most important aspects of recording is the recording level, measured in decibels. While recording, the decibel level should never go above 0dB because digital clipping can occur. Digital clipping, a kind of audio distortion, makes your recording sound as though pieces are missing. In each program's recording function, I could monitor the recording levels and change them if necessary. When monitoring the recording levels, a meter is displayed and as music plays, the meter moves. Normally, the meter stays in the green region and occasionally, it will move into the yellow region. However, if the meter registers in the red region, the decibel level is too high. Before recording, I played music to make sure my recording levels were set in the right region. For example, when using Creative Recorder, I adjusted the levels using the Recording Level slider.

Clean. After recording the tracks, I cleaned up the sound. To achieve quality sound, maintain consistent volume levels and remove extraneous noise such as pops, clicks, and hisses. Each program mentioned has features for dealing with these issues. For example, in SoundForge 6.0, you can normalize the audio, which ensures a consistent volume level across tracks, without clipping. I chose to normalize using a peak level. To do this, I selected Normalize from the Process menu. In the Normalize dialog box, I chose Maximize Peak Value for the Preset, and I selected the Peak Level radio button for Normalize Using. Next, I clicked Scan Levels and the decibel level for Peak appeared. I then moved the Decibel slider to the match the Peak value and clicked OK.

Getting clean sound quality on your recordings takes practice, but through trial and error, you'll soon find yourself a pro at editing your audio files for optimal sound quality.

Burn. As I said earlier, if you have a CD-RW drive, you more than likely already have burning software on your computer. Once you've cleaned up your audio files, it's time to burn those tracks to CD. Be sure that you burn to an audio CD-R (CD-recordable) and not a CD-RW. CD-RWs are designed mainly for storing data and many home and car stereos are unable to read them.

Mo' Music

With the right tools, transferring your old LPs and cassettes to CD-ROM is a simple task. Just record, clean up, and burn, and you've inexpensively added to your CD collection. ■

BY DANA MONTEY

Microsoft Excel 2002

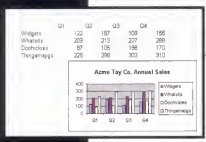
Create Charts, Part I

Few things make you look authoritative faster than a chart. A well-crafted chart makes the trends in your numbers immediately obvious to clients and management, making you look like someone in complete control of your information. With Excel's easy-to-use charting tools, there's no reason not to project this kind of authority.

Start With The Data

A chart can't make your data visual until you've entered the data, so find the data block you'll work with or get typing. Note that charts are linked to the worksheet data they're built on, so when you update figures, the chart changes to reflect the new numbers.

Also remember that Excel builds charts based on how data is entered. For example, Excel pulls row and column labels from your selected data and drops them into the appropriate spots on the chart, whether that means they serve as the label for bars on the chart or as items in the legend indicating what colors of data mean. Excel can't accurately generate both a pie chart and a bar chart, for example, from data set up exactly the same way. As you learn more about Excel's charting feature, you'll better understand the proper data setups for various charts. Look under Create A Chart in Excel's Help feature for examples of setting up data for various chart types.



Assuming you've entered the data correctly for the type of chart you're creating, generating a simple chart such as this one takes about five seconds.

Choose A Chart Type

Now that your data is properly formatted, it's time to start charting by dragging your mouse across the appropriate data to select it. You can select nonadjacent cells by highlighting one block, holding down the CTRL key, and highlighting another block. Just remember that all the selected pieces must form a rectangle for Excel to recognize the data properly.

The quick way to create a chart is to click the Chart button (if you don't see it, choose View, Toolbars, Chart) and do all the formatting later. If you'd rather tweak the details of your chart right from the start, crank up the Chart Wizard by choosing Insert, Chart.

The step-by-step wizard first asks you to choose a chart type. Excel offers 11 general types ranging from the basic bar and line charts to the more esoteric doughnut and radar charts. Within each chart type are a variety of subtypes. Excel provides seven styles of column charts, for example, and six styles of pie charts. You'll see thumbnails of each chart style in the dialog box. Click and hold the large button at the bottom of the dialog box to see a sample of the chart with your data plotted on it. If the 70-some chart options on the Standard Types tab don't cover your needs, click the Custom Types tab for a whole new round of choices of various effects in black-and-white and 3D.

Send In The Data

Click Next to clarify how Excel should pull in data for your chart. Your data range should already be filled in because you highlighted a block of cells before starting up the Chart Wizard. Excel assumes column headings will be used as labels along the horizontal (or X) axis; row labels become the labels in the legend. (Trust us: This makes sense, as you'll see when you experiment with your own chart.) You can flip that assumption by clicking the Columns radio button instead of Rows. The dialog box includes a live thumbnail image of your chart, making it much easier to understand the effect your choices have.

Click Next to work with Chart Options, such as how many gridlines appear and where the legend is placed beside the chart. Excel automatically sets the chart's size based on the data, so you don't have to worry about deciding whether your chart should top out at 100 or 1,000, for example.

Click Next again for the final step, which is deciding whether your chart will appear on the same sheet as its source data or go on its own worksheet.

The key to mastering Excel's charting features is to truly understand how it draws data from a worksheet to create a chart. The best way to learn this is by setting up various blocks of data and seeing how Excel builds charts from them.

After you spend some time trying various setups, turn to next month's article, which will cover ways to customize the looks of your charts.

BY TREVOR MEERS

Lotus 1-2-3

Between The Sheets

Users sometimes overlook the fact that they can use sheets to manage data. For instance, when tracking your budget, you could create a separate file for each month, but it is certainly easier to move back and forth among different sheets within one file.

Think of sheets as pages within a book (in fact, 1-2-3 calls its files "workbooks"). Each sheet has a tab at the top that displays the sheet's name. New workbooks start with just one sheet; to create more, click Create, Sheet. Enter the number of new sheets you want, choose whether to place them before or after the currently displayed sheet, and click OK. An even quicker way of creating a new sheet is clicking the New Sheet button to the right of the sheet tabs. Once you have multiple sheets, click the tab of the one you want to use. Deleting a sheet is even simpler. Right-click its tab and select Delete Sheet.

If you are using many different sheets, use descriptive names and color-coded tabs to organize the sheets.

By default, 1-2-3 assigns letters to each new sheet, but if you want to give the sheet a more descriptive name, double-click the tab, type a new name, and press ENTER.

Organize The Sheets

If you've created and renamed your sheets but they aren't in the right order, just move them around. Move the pointer to the right edge of the sheet tab until it turns into a grabbing hand. Click and drag the hand to a new position among the sheet tabs.

Once you have created several sheets, you may find some of the tabs disappear. Don't worry; all of your sheets are still there. Once 1-2-3 runs out of room, you have to scroll left and right to view all the sheet tabs. To scroll, use the arrows next to the New Sheet button.

You can further give some order to sheets by coloring the tabs. Right-click a tab and select Sheet properties. Click the Basics tab, click the arrow next to Tab color, and select a color.

Now, let's say you have organized your data in several sheets, but you would like to conceal some of it. Hide an entire sheet by right-clicking the sheet tab and clicking Hide. To unhide a sheet, right-click any sheet tab, choose Unhide from the menu, select the sheet you want to unhide, and click OK.

Use Cell References

Even though you have several sheets, you may use some of the same data in the different sheets. In a budget, for example, the amount for rent may be the same each month. In this case, using cell references can be helpful. This way, if the data changes, you can make the change on one sheet, and 1-2-3 automatically updates the cells in other sheets.

A cell reference points to another cell, using the cell's address and then grabs the data in that cell. To use a cell reference, in an empty cell, type the plus sign (+), then the cell address, which consists of a column letter and row number (A1 or V199). To point to a cell located in a different sheet, first type the plus sign, then enter the sheet's name, a colon, and the column and row address (for example, Mar 02:G100 or B:B100).

Group Sheets

Lastly, if you want several sheets to have the same look, group them together. To do this, format one sheet to your liking—change its colors, fonts, column sizes, and so on. Then from the Sheet menu, click Group Sheets. Specify the first and last sheets in the group in the appropriate fields. The sheets do need to be adjacent. Then, in the Copy Styles From This Sheet list, click the sheet whose formatting you want to use for the group and click OK.

If you make a format change in one sheet, all sheets in the group change, including column or row deletions, so be careful how you erase data. To ungroup, click Sheet, Clear Sheet Group. You can only have one group per file, but you can group and ungroup sheets to apply or reapply formatting to more than one sheet.

Sheets are a simple but effective tool for managing your work. Arranging your information in different sheets makes it all that much easier to organize data logically, print specific pages, and share information clearly with others. ■

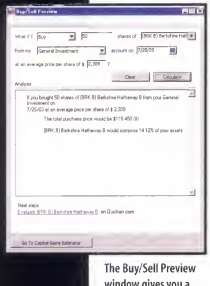
BY TRACEY DISHMAN PATTERSON

Quicken 2003 Premier

Use Quicken's Crystal Ball To Buy & Sell Securities

If there's one thing that universally drives investors crazy, it's the unknown. From day to day, you never know which way the stock markets or bond prices—or the CEO's occasional cooked books—will go.

Nothing, not even Quicken 2003 Premier, can help you control or know for certain the future directions of the markets and your investments. However, the software can help you use the facts you do know and the conditions you can control, letting you make the most financially sensible decisions when buying or selling securities. (Before using the tools described here, you'll need to be tracking your investment accounts in Quicken.)



The Buy/Sell Preview window gives you a look at how a security transaction may affect your portfolio.

Buy/Sell Preview

Quicken's Buy/Sell Preview tool can help you determine whether it's a good idea to buy or sell a particular stock or mutual fund. Click the Investing menu and Buy/Sell Preview.

Select Buy or Sell from the first text box and then fill in the remainder of the text boxes. If you enter a stock or mutual fund in the Shares Of text box that isn't already entered into your Quicken Portfolio, Quicken will open the Set Up New Security window, letting you track down the trading symbol for the stock or mutual fund.

In the Average Price Per Share text box, enter the price at which you plan to buy or sell the security; if the security is already entered into your Quicken Portfolio, Quicken automatically will enter the latest price it has downloaded for the security. However, you can change the price per share if you want. (Just try to keep the price as realistic as possible to achieve the most accurate results.) With all of the text boxes filled in, click the Calculate button.

If you're running a Buy scenario, Quicken then will show you the total purchase price (but it won't calculate any transaction fees you might incur) and the percentage of your overall portfolio that the newly purchased security will encompass. If you're running a Sell scenario, Quicken will calculate your gross proceeds, as well as any federal taxes owed on any gains (or any tax deductions on a loss).

For additional information on the security, click the Evaluate On Quicken.com text link at the bottom of the window.

Capital Gains Estimator

When selling securities or mutual funds in a taxable investment account, you will generate gains or losses, both of which will have an effect on your income tax situation. Before making the sale, use Quicken to determine which particular lots you should sell to generate the most favorable tax bill.

To reach the Capital Gains Estimator window, click the Investing menu and Capital Gains Estimator (or click the Capital Gains Estimator text link at the bottom of the Buy/Sell Preview window). Click the Welcome link in the upper-left corner of the window to start the tool, followed by Let's Get Started.

Create a scenario for your tax situation, choose the accounts to include, and select your tax bracket as you move through the tool's pages. (Click Next to move to each subsequent page.) If you have any capital losses to carry over from previous tax years, enter the amounts. On the What Should I Sell? page, fill in information about your goals and click Search. After Quicken runs its calculations, click View Results to open a page containing Quicken's list of recommendations (listed under Step 2 of the page). The lower half of the page will show the taxable gains or losses the proposed sale will generate, as well as its affect on your gross proceeds.

If you'd rather manually select the securities you'd like to sell, click a scenario on the left side of the Capital Gains Estimator window. In Step 1 on the page, place a check mark next to the securities you plan to sell. In Step 2, enter the number of shares you'll sell from each lot and the estimated sale price. In Step 3 and in the lower portion of the page, Quicken will estimate any gains or losses you might have, as well as how the transactions will affect your tax situation. ■

BY KYLE SCHURMAN

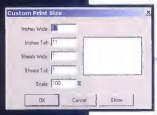
The Print Shop 15 Deluxe

Create Oversized Projects

Oversized formats can make your project stand out among others that use a standard 8.5- x 11- or 8.5- x 14-inch format. There are two ways to produce oversized projects with Print Shop Deluxe. You can set up your project in the beginning to be oversized, say 11 x 17 inches, or you can enlarge the project later when you print it. We'll show you how to do both.

Oversized Setup

Users of Print Shop Deluxe aren't restricted to projects of 8.5 x 11 inches, even if that is all your printer can handle. You can also create projects of other dimensions, such as 11 x 17, through the Broderbund PDF (Portable Document Format) Creator. The PDF can then be printed professionally or on a different printer that accommodates the size.



The Custom Print Size dialog box lets you specify the amount of magnification and tells you how many sheets your project will need to print.

You can also send it as a file attachment to be viewed with Acrobat Reader.

First set up the project in the format you want to use. We will create an 11- x 17-inch project. Click the Project Picker button on the Object toolbar along the left side of the Print Shop window. Click Blank Pages and then the Next button. Select a Wide format and then click Finish. Click File, Printing, Print Setup. Click the Name drop-down menu and choose Broderbund PDF Creator. Click the Size drop-down menu and choose Tabloid to create an 11- x 17-inch project. Choose Default Bin for Paper Source and Landscape for Orientation. Click OK.

The blank project now appears on the design desk in 11- x 17-inch format ready to be designed. You can borrow design elements from the included QuickStart Layouts even though you created a blank project. We copied elements from a QuickStart Layout in the Business section of the Signs category.

Once you are done designing your project, you will need to save it in the PDF format. There are several ways to do this. Click File, Save As PDF or click the Finish Project button on the Object tool bar and click Save As PDF and Next. You can also click the Professional Printing button on the top toolbar, then click the Save As PDF button in the dialog box. Or click File, Printing, Print Setup and select Broderbund PDF Creator from the Name box. Then click File, Print, and click the Print button in the dialog box.

You will reach the same destination regardless of which method you choose. A dialog box will prompt you to name the file and set the resolution of the print. Check the documentation for your printer to find the optimum resolution. Use the maximum resolution available if you are having the project printed professionally. Click Save. You now have an oversized project in PDF format. You can send the PDF file as an attachment or take the file in for professional printing. (Broderbund no longer offers professional printing through its Web site.)

Magnify At Printing

The second way to create an oversized project is to magnify it at printing. In this case, you can produce the project on any printer because the printing is done on separate sheets that are then assembled to produce the finished project. An 8.5- x 11-inch project, for example, can be magnified 150% to attain the size of 12.75 x 16.5 inches spread over four sheets.

Click File, Print to open the Print dialog box. Click Setup and choose the printer, paper size, and orientation you wish to use. Click OK.

Click the Output Size button. This brings up the Custom Print Size dialog box. Here you can determine the amount of magnification in a variety of ways. When you change one of the measurements and then click a different box, the other measurements change automatically to keep the proportions of the project the same. For example, changing the width of an 11- x 8.5-inch project to 14 inches changes the height to 10.8 inches and requires four total sheets.

The Inches Wide and Inches Tall fields let you specify new dimensions for the project. The Sheets Wide and Sheets Tall fields let you determine how many sheets of paper you want the project to extend across. The Scale field lets you specify the exact percentage of magnification you want to apply to the project. Click OK and Print after setting these values.

There's no reason to be stuck with the same old boring letter- and legal-sized projects. Try the methods described above to have a bigger impact on your audience. ■

BY TOM HANCOCK

WordPerfect 10

Accelerate Document Production With QuickWords

Typing long words, phrases, or whole paragraphs over and over makes for a tedious enterprise. WordPerfect's QuickWords feature transforms this tiresome exercise with a snappy sequence of programmed keystrokes.

Quick Basics

A QuickWord is an abbreviation of a word, phrase, or paragraph inserted into a document. When you type this abbreviation into the document, QuickWords automatically expands the abbreviation into the original text. For example, if your preferred closing in a letter is "With best regards," you could create a QuickWord, such as "wbr," to represent that phrase. When you type wbr, WordPerfect inserts the entire phrase in its place. QuickWords even works with graphics, such as clip art and company logos.

Use Reveal Codes to create a QuickWord graphic entry.

Create QuickWords

When you create QuickWords, consider the abbreviation carefully. Avoid using common words as QuickWords or you'll turn a useful tool into a frustrating feature. For instance, if you use the word "for" as an abbreviation for "Fortune 500," each time you type **for** WordPerfect will expand it to "Fortune 500." Add an additional character, such as an ampersand or a number (for example, for5) to steer clear of this pitfall.

Type the word or phrase you want to make into a QuickWord in the document. Apply the font attributes you prefer and select the text. Click Tools and QuickWords. The QuickCorrect dialog opens with the QuickWords tab displayed. Type the abbreviation you've chosen to represent the word or phrase in the Abbreviated Form field. Click Add Entry.

Creating a QuickWord entry for a graphic is slightly more complicated and requires use of the Reveal Codes dialog box. Insert the graphic into a document or open a document that already contains the graphic. Click View and Reveal Codes. In the Reveal Codes dialog box, click to the immediate left of the Graphics Box code so that the red cursor appears there. Press SHIFT-Right arrow to select the graphic. Click Tools and then QuickWords. The QuickCorrect dialog box appears. In the Abbreviated Form field, type the abbreviation you want to represent the graphic. Click Options, Expand As Text With Formatting to ensure the graphic displays in the document, and Add Entry.

Insert & Expand

To insert QuickWords, click where you want the expanded form to appear. Type the abbreviation and then press ENTER, TAB, or the Spacebar. WordPerfect automatically expands the QuickWord entry.

If the abbreviation doesn't expand, the Expand QuickWords When You Type Them option has been disabled. To enable it, return to the QuickCorrect dialog box (Tools, QuickWords) and check the box next to Expand QuickWords When You Type Them. Uncheck this box again to turn off the QuickWords feature.

You can also manually expand the QuickWord by pressing CTRL-SHIFT-A. Another means of inserting QuickWords into documents is through the QuickWords tab in the QuickCorrect dialog box. Select the appropriate entry from the list and click Insert In Text.

Update Entries

From time to time existing entries may need some updating. Whatever the reason, it's easy to update a QuickWords entry.

To replace all or a portion of a QuickWord entry, first type the new information and then select it. Click Tools and then QuickWords. Click the entry that you want to assign to the text you've just selected. Click the Options button and choose Replace Entry. When the Confirmation Message box appears, click Yes.

If an abbreviation becomes ill suited for the entry, rename it through the QuickCorrect dialog box. On the QuickWords tab, select the entry and click Options, Rename Entry. Type the new name and click OK. Delete unused QuickWords through this tab also. Simply select the retired entry and click Delete Entry.

Review your entries periodically to refresh your memory—and save some time and tedium with WordPerfect's handy tool. ■

BY ANNE STEYER PHELPS

Microsoft Word 2002

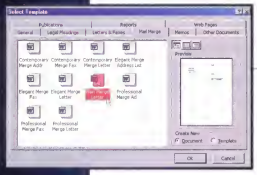
Automate Mass Communication With Mail Merge

Of all the features in Microsoft Word, Mail Merge has one of the more intimidating reputations. It's a means of inserting changing data (names, addresses, etc.) into copy after copy of a master document—and it sure puts a tremor of fear into some people.

Really, though, it's not that bad, and if you ever need to dispatch a group communique, it's well-worth adding facility with Mail Merge to your repertoire of skills.

Mail Merge Basics

A successful Mail Merge requires two cooperative partners: your main document, such as a letter, an email message, or an envelope form, and a data list, containing the items you'll be plugging into each copy of the main document (for example, your email contact list.)



These merge-ready letter templates will help you perform a Mail Merge more quickly than creating a master document from scratch.

Because there are so many variables along the way, for illustration purposes, we'll follow one specific path: adapting a brief form letter from a template and creating a short list of recipients.

Summon The Wizard

The Mail Merge toolbar has all you need to do everything from scratch, but it's easier to get familiar with the process by using its wizard. Under the Tools Menu, select Letters And Mailings, then Mail Merge Wizard. Instead of using a separate dialog box, the wizard will open in the Task Pane. (You can also choose Mail Merge directly from the Task Pane's drop-down menu bar.)

Under Select Document Type, click the Letters radio button and click Next. For the Starting Document, choose Start From A Template and click Select Template. In the dialog box, select the Plain Merge Letter icon and click OK; it will open in your document workspace, displaying various text fields and placeholders. Back in the Task Pane, click Next.

Now let's establish your recipients. One of the quickest ways is to use Microsoft Outlook's address book and target specific people from its contact list, but let's not make things too easy. Instead, let's say you want to start a list that will be used exclusively for merge mailings. Therefore, select Type A New List and click Create.

In the dialog box, whip up a short list of recipients (four or five will do), clicking New Entry whenever you want to add another. When finished, click Close; you'll be directed to save the list as a file you can access in the future. This, in turn, will display your list in a table format where you can edit entries and omit recipients from specific mailings. Click OK to close it and continue.

Prepare Your Document

Click Next to advance to Step 4, where you'll personalize the letter template. Compose a short message to replace the placeholder text and add your name to the closing.

By clicking inside the template's Address Block and Greeting Line data fields and then clicking their counterparts in the Task Pane, you'll open dialog boxes in which you can specify the formatting for the information in your recipient list. You'll see each change reflected in the Preview window's sample text. After you click OK and the dialog box closes, you might see an actual address wedged in the middle of the Address Block phrase, but don't worry, it's only temporary.

Click Next to preview your letters, using the left-right arrows to step through them one-by-one. Click Next one more time and you're almost there.

Ready, Set, Merge

In the final step, you can make a last-minute addition to one or more letters. Click Edit Individual Letters and use the dialog box to specify whether it applies to all of them, a select range, or the current letter only (make sure you've called up the proper one in the Preview step or use the Mail Merge toolbar arrows to find it). Finally, click Print to let the magic begin.

Although Mail Merge is a complex feature, the wizard and basic templates should take care of all but the most complicated mass communication needs. ||

BY BRIAN HODGE

Quick Tips

Secrets For Succeeding In Common Tasks

Faster PC Startup

You can speed up the boot process by booting directly to your PC's hard drive. Enter your PC's BIOS (Basic Input/Output System) by pressing the DELETE or F1 key as your system starts up. (Some systems may use a different key to enter the BIOS. This information should be displayed when you first start your PC.) Different BIOSes use different procedures to set the hard drive as the first boot device; here are a few common examples. If you see BOOT listed as one of the menus at the top of the window, press the Right arrow key to highlight it. Press the Down arrow key to highlight the hard drive, which is probably listed as the second or third boot device. Press the plus sign (+) key to move the hard drive up to the first boot device. Press F10 to save and select Yes when asked if you want to save changes and exit the BIOS.

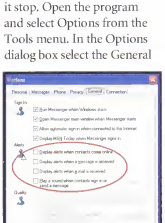
If BOOT isn't listed as a menu option, Advanced BIOS Features should be. Press the Down arrow to highlight Advanced BIOS features and press ENTER. Press the Down arrow to select First Boot Device and press ENTER again. Select Hard Drive 0 and press the ENTER key to select it. As before, press F10 to save the new settings.

Web Browsers

If you've ever started your Internet browser and typed in a URL (uniform resource locator) you found in a magazine, you might not have reached the Web page you wanted. If you see the "The Page Cannot Be Found" error, you may already know to check your typing and punctuation marks. What you may not know is that some URLs are case-sensitive. For example, if you type **http://www.digitalmediafx.com/Columns/joetracy.html** with a lowercase letter c in columns, it won't work. If you're sure you typed the URL correctly, try it again later in case the Web page's server is temporarily down.

MSN Messenger 5.0

If you're fed up with the way MSN Messenger frequently displays alert boxes and nudges you with sound effects, there is a way to make it stop. Open the program and select Options from the Tools menu. In the Options dialog box select the General tab and under Alerts, uncheck the appropriate checkboxes. Click OK. If you uncheck all of the Alert checkboxes, MSN Messenger will not alert you when contacts come online or when you receive a new MSN Messenger message or a new email message.



You can put an end to MSN Messenger 5.0's alert-sending spree by selecting Options from the Tools menu, selecting the General tab, and deselecting the appropriate alert options.

Printers

When you want to print a document quickly, few things are more irritating than a paper jam. To avoid this nuisance, check your owners manual for the ideal paper type and weight. Fan through the stack of paper to separate the sheets before placing the paper in the feeder tray. Also, don't exceed the maximum number of sheets recommended for the feeder tray. Because moist paper tends to curl and jam, another way to prevent paper jams is to limit the humidity in your work area. If this isn't possible, store the paper in a drier location until you're ready to print.

Video Editing

Most video-editing programs include many transitions, some of which are pretty wild. It's OK to use specialty transitions once in a while, but generally there are only two you need to use, and you don't need to use them all the time. First, use a basic Fade transition at the very beginning and end of the video. Use a simple cut (no transition) between video clips from the same scene. If the scene changes (for example, from a day scene to an evening scene, or a different location), Dissolve is a nice transition to use. The video clip will gradually fade into the next one. It's sweet and simple, which is preferable to more exotic transitions because you don't want them to distract from the video itself.

Software Installation

If you have multiple partitions on your hard drive, you can separate your applications and documents from Windows. Most installation utilities let you choose where to install a new application, such as C:\PROGRAM FILES\Application Name. Unfortunately, it's easy to overtype this file path if you attempt to change it, as the entire path is usually highlighted by default. To avoid retyping the whole file path, highlight just the letter C. Type D (or your partition's drive letter) to get D:\PROGRAM FILES\Application Name and finish the installation.

Windows Media Player 7/8/9

To keep WMP (Windows Media Player) up to date with the latest enhancements and codecs (compression/decompression software), you'll first need an active Internet connection. Use the Help menu to have WMP check for the latest updates or have WMP update itself automatically on a regular basis. Select Options from the Tools menu and click the Player tab. If you're using WMP 7, under Auto Upgrade, check the Enable Automatic Codec Download checkbox; if you're using WMP 8/9, under Automatic Updates, check the Download Codecs Automatically checkbox. Select the radio button next to the appropriate frequency. Click OK.

Excel 95/97/2000/2002

You can personalize and make Excel spreadsheets more attractive by adding background graphics. To do this, click the Format menu, Sheet, and Background. In the Sheet Background dialog box, browse your files for the image you want to set as the background. Click to select it and click the Insert button. The image repeats as many times as needed to tile and fill the screen. You may want to use a photo editor, such as Adobe Photoshop Elements, to lighten an image before setting it as the background so the graphic doesn't obscure the text in the spreadsheet.

Floppy Diskettes

Floppy diskettes are losing appeal as cheap CD-RW (CD-rewriteable) drives and media are becoming more common. Still, floppies are a useful way to transfer small image files. If you find that an image file is too large to fit on a floppy, try saving the file as a JPEG (Joint Photographic Experts Group) image. (You can do this in the Windows Paint program.) JPEGs are a lot smaller than most image file types, so it's more likely that you can fit the JPEG on a floppy.

Virtual Memory

All recent versions of Windows use virtual memory (also called a swap file), which is hard drive space that acts as extra RAM. Some users tell Windows to store the swap file on a second hard drive. This can speed up their computing sessions somewhat. However, some systems have problems when the swap file is on a second drive. Try moving the swap file back to the Windows drive. Using Windows Me as an example, right-click My Computer, then choose Properties, Performance, and Virtual Memory. In the Hard Disk field, choose the C: drive, then OK, Yes, and OK.

Email

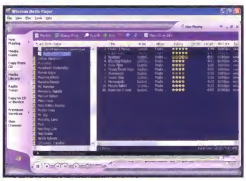
Most popular client and Web-based email programs, including MSN and Microsoft Outlook, have an option for saving email messages to a location other than within the program itself. This comes in handy if you'd like to save email messages and open them later without the aid of an email program. Open the message and select Save As from the File menu. The default might be a proprietary format (in MSN, for example, it adds the extension .EMAIL), but if you scroll through the options in the Save As Type box, you can select .TXT (which you can open later as a simple text file), .HTML (which you can open in a Web browser), or another common format.

Word 95/97/2000/2002

You may want to hide certain text within a document that no one can see on-screen or on a printed copy. Highlight the portion you want to hide. Click the Format menu and Font. Place a check mark in the Hidden checkbox and click OK. The selected text disappears from your screen. To make sure you do not accidentally delete invisible text while editing, click Tools and Options. Select the Hidden Text checkbox and click OK. The text reappears with a dotted underline. To hide the hidden text later, click Tools and Options, deselect the Hidden Text checkbox, and click OK.

Windows Media Player 9

One of WMP 9's coolest features is the ability to rate your favorite songs on a five-star scale. To rate songs, click Media Library and select All Music in the left window pane. One of the categories for the songs that will appear is Rating, and you'll see a row of stars for each song. Move your mouse over the stars and click the number of stars that you want to apply to the rating. When you rate music in WMP, you can quickly load up and play your favorite tunes. Click the drop-down menu in the upper-right corner. Scroll down and click Favorites—4 And 5 Star Rated to load up and play your favorite music.



Use Windows Media Player to rate your favorite music.

Heatsinks

Your microprocessor needs a metal heatsink and probably a fan to keep it cool, but dust and grime can act like a warm blanket. Blow the dust out of your heatsink every few months with low-pressure compressed air. If you remove the heatsink to replace or clean it, degrease its base with a cleaner that isn't petroleum-based, such as acetone. Petroleum- and citrus-based cleaners can leave residues that will impair heat transfer. Apply a thin, even film of thermal compound, such as Arctic Silver 3 (http://www.arcticsilver.com), to your microprocessor's die before you reinstall the heatsink.

Excel 95/97/2000/2002

Sometimes when you try to paste copied data from a group of cells, the pasted data has the wrong format or the wrong numbers, or it doesn't compute. You can control the manner in which Excel pastes values and formulas, however. Highlight the cells you want to copy and click the Edit menu and Copy. Click the first cell to which you want to paste copied data. Click the Edit menu and Paste Special. In the Paste Special dialog box, select the type of information you would like to paste from choices such as Formulas, Values, Formats, and Column Widths. Click OK.

Unwired...

Unplugged, uncompromised, uncamplicated... There are lots of wards to describe the unparalleled 802.11b Cable/DSL Wireless Router (MR814) from NETGEAR®.

Unplugged for convenience. The MR814 offers just what you need for unhampered access and connections. You'll get a router, switch and access point all in one solution. We also offer an optional USB notebook adapter card.

Uncompromised for security. Concerned about hackers? The MR814's NAT firewall makes data unavailable to all but your users. Internet activities are secure with content and URL filtering. Plus, you'll get a free, one-year subscription of Freedom® Personal Firewall software for up to eight connected PCs.

Uncomplicated for easy set-up. The MR814 was designed for home/small office use, featuring plug-and-play installation with our Smart Wizard. You'll be up and running in minutes - unlike with other wireless solutions.

Unparalleled for support and style. Take advantage of this award-winning solution that conforms to industry standards and is backed by 24x7 toll-free support. A solution enclosed in a sleek, smartly designed, space-saving case. Available at a price that makes the MR814 an uncommon value. For details, visit **www.netgear.com**. And get unwired.

PC Magazine (August 2002)
NETGEAR Home Networking

ID Magazine (August 2002)
2002 Design Review
Consumer Products

CNET (November 2002)
Editors' Choice
Networking & Wireless

ZDNet (November 2002)
Editors' Choice
Networking

Everybody's connecting.™

NETGEAR®

©2003 NETGEAR, Inc. NETGEAR is a registered trademark and "Everybody's connecting" is a trademark of NETGEAR, Inc. All rights reserved. Other brand and product are trademarks of their respective holders. Specifications subject to change without notice. 6371-CS-CPR

It Just Makes ¢ents

Need help using our site?
Email
webhelp@smartcomputing.com
or call
(800) 368-8304

For the low price of $29 a year, you get more than just a subscription to a great publication; you receive access to the entire family of Smart Computing products. That includes a virtually endless supply of computing information from the Smart Computing print publication, two Web sites, and three online publications (see the next page for more information).

Here are just a few of the features you'll see at SmartComputing.com:

Q&A Board

Can't find answers to your computer problems? Post a question on the Q&A Board and let your fellow subscribers help. It definitely beats waiting on hold for a technical support person.

Search All Articles

If you want to search for past *Smart Computing* articles on a particular topic, use our easy-to-use Search All Articles feature.

Read Hardware Reviews

If you are interested in buying a new hardware product, check out our review of the product in our online Hardware Reviews section. As a subscriber, you have access to all of our hardware reviews (we add dozens each month), and you can compare multiple products with our interactive comparison charts.

NEW! Web Services Help

We have a new Web Services team to help you with any SmartComputing.com site problems you encounter. If you have any questions about using the Web site or its features, please feel free to call our Web Services team. The team is available from 7 a.m. to 6 p.m. CST Monday through Friday at (800) 368-8304, or you may email webhelp@smartcomputing.com.

SITE GUIDE TIPS

Computing Chat Rooms

As a subscriber to *Smart Computing*, you can join in our chat rooms. Click the Computing Chat Rooms link on the home page. There are six rooms to choose from, and the rooms currently in use are marked with an asterisk. Click the link to enter the room. You'll find the most activity in Chat Room 1 in the evenings.

July Web-Only Articles

Here's a list of this month's additional articles available to you online as a paid subscriber to *Smart Computing*. To view these articles, click the link in the Web-Only Articles area in the left column of the home page. (Only subscribers can read the complete article.)

Hardware

For all the latest product reviews, visit the Hardware Reviews & Comparison Charts area at Smart-Computing.com (http://www.smartcomputing.com).

Software

Drive Utilities: Aladdin Systems StuffIt Deluxe 8.0 For Windows

Graphic Manipulation: Adobe Photoshop Album 1.0

Misc. Consumer: Broderbund Home Landscape Designer Deluxe 5.0

PDA/Portable: PocketCraft Facer 1.6

Interfaces: Stardock SkinStudio XP

PC Operating Instructions

Linux:
Schedule With Cron

Here is an example of the plaintext file used to schedule Cron jobs. Although you can use the crontab –e command to schedule new jobs and edit existing ones, it's generally recommended to make changes to a text file and rerun crontab.

Win9x/Me:
DLL Hell

Most of the time, DLL (dynamic-link library) files share code and play nicely, but on occasion, problems do arise. We'll help you sort through the mess and get your favorite programs back up and running.

Quick Studies

Security
Share Across A Firewall

Microsoft Works Suite 2002
Add Contacts To Address Book

PageMaker 7
Create Lines & Shapes

Web Browsers
Take Charge Of Web Pictures

Email
Back Up Your Email

Roxio PhotoSuite 4.0
Enhance Your Photos With Clip Art

Photoshop 6.0
Annotate Your Images

Microsoft PowerPoint 2002
Share Documents For Peer Review

Online
Watch The World Through TV4all.com

Access 2002
Learn How To Concatenate Fields

HTML
Cascading Style Sheets, Part 2

SITE GUIDE TIPS

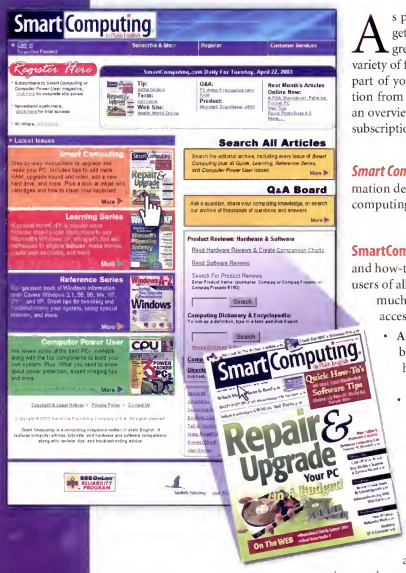
Renew Your Subscription Online

Make sure you don't miss any of the benefits you receive as a member of the *Smart Computing* family. We make it easy for you to renew your subscription online. From the home page, log in, place your pointer over the Subscribe & Shop area, and click Renew Subscription. Your contact information will already be filled in with your current information. Just select your new subscription offer and you're set.

Only paid subscribers to *Smart Computing* magazine get full access to SmartComputing.com.

This Month's Feature:

You Get It All!



As part of your subscription to *Smart Computing*, you get much more than just a magazine and access to a great Web site. Our objective is to provide you with a variety of features to enhance your computing experience. As part of your subscription, you receive computing information from our full family of publications and sites. Below is an overview of everything you get for the small price of a $29 subscription to *Smart Computing*.

Smart Computing is your main source of computing information devoted to helping you improve your personal computing skills.

SmartComputing.com is your source for computing tips and how-to information. The site brings together computer users of all levels, providing constantly updated articles and much more. Subscribers to *Smart Computing* receive access to the great features highlighted below.

- **Article Database.** Access all print issues and articles by clicking the Search All Articles link on the home page.
- **Q&A Board.** Having a pesky problem with a computer-related topic? You may be able to find answers to your questions on the Q&A Board. Peruse all questions asked within the past 30 days or post a question yourself and see if your fellow subscribers are able to help.
- **Hardware Reviews.** From the home page, click the Read Hardware Reviews & Create Comparison Charts link. Only subscribers are able to read the full text of hardware reviews and create charts to compare various products.
- **Web-Only Articles.** As a subscriber to *Smart Computing*, you have access to special content we create each month and make available only on our Web site. After logging in to the SmartComputing.com site, you will see the Web-Only Articles feature under your email address. Use the Click Here link to view the list of this month's Web-only articles.
- **Next Month's Articles Online Now.** This is our way of giving you a sneak peek into what we have planned for next month. You'll see a list of the most recent additions to the site on the right side of the SmartComputing.com Daily section on the home page.

Along with all that content available at SmartComputing.com, you also get access to these complete issues.

- *Learning Series* offers in-depth coverage on a specific topic each month, including the tips, tricks, and troubleshooting information you need.
- *Reference Series* is published each quarter and acts as your all-in-one resource for computing facts and information. Each issue is designed to take home, put next to your PC, and refer to for years to come.
- *Computer Power User* is a monthly print publication aimed at tech-savvy readers. The magazine is written in an informative, yet entertaining fashion for people who want honest reviews, useful tips, and opinions from world-class computing experts.

Don't Forget About ComputerPowerUser.com

ComputerPowerUser.com brings information to the skilled computer user. Subscribers to either *Smart Computing* or *Computer Power User* receive full access to both the SmartComputing.com and ComputerPowerUser.com sites.

You'll find many of the same features on both SmartComputing.com and ComputerPowerUser.com. But you'll want to visit ComputerPowerUser.com for this unique content:

- **CPU Forums.** If you want to ask a question, discuss a topic, or just show off your computer knowledge, the CPU Forums are the place to go. Click the CPU Forums link from the home page.
- **CPU Web Log.** Each day, our editors bring you some of the latest high-tech news in an entertaining fashion. Make it a daily stop to get up to date on the latest tech news.

Still Not Convinced?

Don't forget that you get all this great information for the low cost of your $29 yearly subscription:

Access to our entire family of publications. From the home page, you can access all four publications on the left side under Latest Issues. Click the cover image to view the table of contents for each publication. Click View Full Table Of Contents to view all articles, including Web-only articles, for that publication. Click Buy This Issue in the upper right if you would like to purchase a print version of the publication.

Access to our 18,000-article library. Now it's easier than ever to find articles. From the yellow Search All Articles box on the home page, simply click the View All Articles link. Articles appear in alphabetical order, by title. Click the title to read the article. The bibliography information after each article title tells which publication the article is from.

Complete access to more than 300 issues. Check out all the content available to you as part of your subscription. Find the yellow Search All Articles box on the home page. Click the View All Issues link to see a list of all issues available online, for all publications. To jump to a different publication, click the title of the publication in the upper left. Click the title of the issue to view the full table of contents.

Access the *Computer Power User* Web site. Type http://www.computerpoweruser.com in your browser's Address bar and log in with the username and password you use on SmartComputing.com. As a subscriber to *Smart Computing*, you have access to all *CPU* subscriber areas, as well.

Find More Online

We can't possibly fit every helpful tip, tweak, or troubleshooting tidbit in print. That's why you'll find a wealth of resources at our Web site, SmartComputing.com. Here are some tips for using our Web site to find more information about the articles in this month's print issue.

More Digital Imaging Information

This month's feature package includes information about printers, scanners, and digital imaging.

1. To read about other questions or situations subscribers have encountered with digital imaging, take a look at the Q&A Board. Click the Q&A Board box on the home page and type **Digital Imaging** in the text box in the search section at the bottom of the page. Click Search. All Q&A posts related to digital imaging will appear. If you have a specific question about digital imaging you cannot find an answer to, post a question on the Q&A Board.

2. For more information about printers, digital cameras, or scanners, check out the Hardware Reviews section. Click the Read Hardware Reviews & Create Comparison Charts link. Select a category and then choose the specific hardware review you would like to read. You can also select one or more products from the list to create a side-by-side comparison chart.

3. Be sure to search our article library, using the Search All Articles feature, to find more articles about subjects of interest to you. Use keywords such as "install a scanner" and "using a digital camera."

MP3 Players

If you would like to read more about MP3 players from our past issues or other publications, click the yellow Search All Articles box on the home page. Type MP3 and click Search. A list of articles with the keyword MP3 appears. Click the article title to read the full article or review. Your search will default to sort results by relevance. If you would like to sort articles by date, click Sort Results By Date at the top of the search results page.

LCD Buyers' Guide

If you are thinking of shopping for a new LCD (liquid-crystal display) monitor, let us help you do some of the work with our Hardware Reviews & Comparison Charts.

- From the home page, click Hardware Reviews, Monitors, and then select those monitors listed under LCD. The search results will provide hardware reviews for that product only.
- To create a comparison chart, click the checkbox next to products you would like to compare and click Create Chart at the bottom of the page. A comparison chart appears on the next page.
- Another option is to type LCD monitor into the text box under Hardware Reviews on the home page. The search will generate any hardware or software reviews related to LCD monitors.

SITE GUIDE TIPS

Email A Friend Link

At the top of any article page on SmartComputing.com or ComputerPowerUser.com, look for the Email This To A Friend link. This link lets you email the complete text of a particular article to people you know. Share a great tip or trick, which you get as part of your membership, with a friend.

SITE GUIDE TIPS

Make Our Home Yours

Make SmartComputing.com your first stop on the Web. Visit http://www.smartcomputing.com, scroll to the bottom of the screen, and click Make SmartComputing.com My Home Site. Follow the instructions for your browser.

SITE GUIDE TIPS

Web-Only Articles

We have even more articles available for subscribers only. After you log in to the SmartComputing.com site, you will see a link to Web-Only Articles under your email address in the upper left. Click the link to view a list of this month's articles available especially for subscribers.

Only paid subscribers to *Smart Computing* magazine get full access to SmartComputing.com.

www.BenQ.com

An LCD like you've never seen. Or heard.

The new BenQ FP591 embodies revolutionary thinking on enjoyment. Next-generation technology drives a fast 16 ms response time enabling dynamic screen motion for DVD, gaming, standard applications or even TV. The super-bright display and extra-high contrast delivers stunning colors and pictures. Video is embraced by SRS® sound processing technology for enjoying high-quality stereo surround sound. A host of additional features and a contemporary case, make the FP591 the centerpiece of any space.

BenQ FP591

The Next-Generation 15" LCD Display

- Stylish ultra-slim modern design
- 16 ms signal response time for dynamic screen motion
- Dual stereo speakers with SRS® surround sound
- Ultra-high 500 cd/m² brightness
- 450:1 contrast ratio for extraordinarily clear, sharp picture quality
- Dual D-Sub analog and DVI-D digital signal support
- Digital Photo Frame displays digital camera pictures directly (optional)

For more information, visit www.BenQ.com/2003/CPU-FP591
To contact us, visit www.BenQ.com/ProdInfo or call (866) 700-2367

BenQ

Enjoyment Matters

©2003 BenQ Incorporated. All rights reserved. All trademarks and registered trademarks are the property of their respective holders. SRS® is the trademark of SRS Labs, Inc
* Please visit www.BenQ.com/2003/CPU-FP767-Promo for contest details. Some restrictions may apply. Contest details subject to change without notice.

Compiled by Dana Montey
Graphics & Design by Jason Codr & Ginger Riley

Take Your Music On The Go

Taking music with you is not a new concept. We had cassette tape players and CD players, and now we have MP3 players. People want to take their tunes with them, and MP3 players make it easier to take more and more music in smaller packages.

MP3 (Moving Picture Experts Group, Audio Layer 3) is a compression format for audio files. When converting your audio files to MP3 format, you can choose the level of compression; however, the higher the compression, the lower the sound quality. The standard MP3 compression ratio is 10:1, which means one minute, or 10MB, of CD-quality music occupies approximately 1MB of storage space. Using MP3 to decrease the size of your audio files, you can transfer those files to a portable MP3 player and take your music everywhere.

Transporting music isn't the only function available on today's MP3 players. Depending on the type of memory your player has, you have more options than just listening to your MP3s. Some MP3 players come with an FM tuner so you can tune into the radio. Others come with PIM (personal information manager) features, such as the ability to store your address book. And you can even find MP3 players with voice recorders.

Transferring your tunes is an easy process. Most computer users already have the necessary software for transferring tracks from audio CDs to PCs. Programs, such as Windows Media Player and RealOne, let you easily download your CD collection to your PC. Your MP3 player should come with the other piece of the software puzzle, software for transferring your ripped tunes to your player. The amount of music that your player can hold depends on how much memory the player has. We will look at two kinds of MP3 players: those with flash memory and those with their own internal hard drives.

Flash Memory

There are no moving parts in MP3 players that use flash memory; therefore, the device never skips. Most flash players come with a certain amount of internal memory (32MB, 64MB, 128MB). At 128MB, you can expect your MP3 player to hold about two hours of music. In addition, most have an expansion slot for more memory. These players tend to be cheaper, smaller, and lighter than their hard drive counterparts.

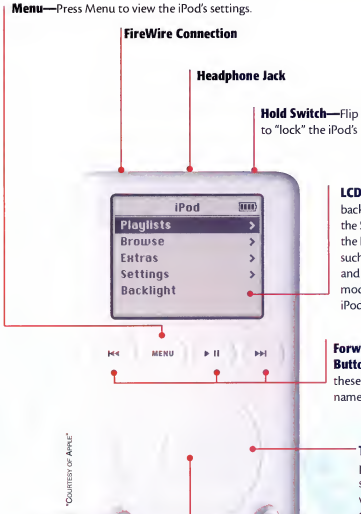
LCD—The backlit LCD (liquid-crystal display) is your visual reference for what's going on with your player. During track playback, the LCD displays all kinds of information, including battery life, artist name, and volume level. In menu mode, the LCD displays all available options as you navigate through the settings.

Play/Pause, Forward, Stop, Back Buttons—During playback, these buttons function as their names suggest. In menu mode, these buttons are used to navigate the options.

Hard Drive

MP3 players with hard drives give you gigabytes of storage space, such as 5GB, 10GB, or 20GB. You can transfer a collection of 100 CDs to a hard drive player and still have room. In addition, most hard drive players let you store other types of information, such as contacts and calendars.

However, hard drive players usually contain moving parts so they aren't skip-free. To combat this issue, most include a buffer for skip protection. Because they have more storage space and extra features, hard drive MP3 players are considerably more expensive than flash memory players.



Menu Button—When you press the Menu button, the LCD will display the Menu options. Using the Play/Pause, Forward, Stop, and Back buttons, you can change the player's settings and/or navigate through your tracks.

Volume Control

Rio S35S

SONICblue's Rio S35S is a small, lightweight flash memory player (0.8 inches high x 2.5 inches wide x 2.75 inches deep; 2.2 ounces) that comes with 128MB of internal memory and an expansion slot, which lets you upgrade to 640MB of memory. The S35S costs $179.99 and includes other features, such as an FM tuner and a stopwatch.

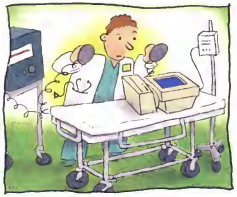
Apple iPod

Apple's iPod comes in three models: 10GB ($299), 15GB ($399), and 30GB ($499; 0.73 inches high x 2.4 inches wide x 4.1 inches deep; 6.2 ounces). iPods aren't just for Mac users; Apple makes the three models for Windows users, as well. The 30GB iPod can hold approximately 7,500 tunes, and you can also store your contacts and calendar on this iPod.

The Real Score On System Restore

The System Restore feature found in Windows XP and Windows Me is one of the most useful features Microsoft has added to Windows in years. Unfortunately, it is also one of Windows' most misunderstood features.

System Restore is a limited disaster recovery tool that takes snapshots (called Restore Points) of critical system files whenever you make a significant change to your computer. If a change precipitates a disaster, you can restore your computer to the point just prior to the change.



System Restore doesn't cause a loss of data, so if you select a Restore Point from a week ago, you won't lose any data created since then. Otherwise, you would have to back up your data prior to restoring your system and restore it afterwards—a real chore.

System Restore is enabled by default. It works behind the scenes, creating Restore Points automatically when any of the following events occur: 1) installation of Windows XP certified applications (a Restore Point is created just prior to the installation), 2) installation of an unsigned driver (a driver that hasn't passed testing standards established by Microsoft's HQL [Windows Hardware Quality Lab]), 3) installation of Microsoft Critical Updates, (Microsoft issued more than 70 critical Windows security updates in 2002; fortunately, Windows creates a Restore Point prior to installing critical updates, as these updates themselves occasionally cause problems), or 4) a System Restore operation. (Microsoft is mindful that you might accidentally restore your system to the wrong point, so prior to restoring your system, Microsoft creates *another* Restore Point, which gives you the ability to undo your undo. Clever.)

System Restore also creates a Restore Point every day you use your computer, whether or not you make any changes.

Finally, System Restore lets you manually create Restore Points, and you should definitely do so prior to making any high-risk change to your computer.

Ball Of Confusion

Unfortunately, some experts are spreading bad advice about System Restore. A recent *InfoWorld* article noted, "A bigger flaw of System Restore, however, is that it only preserves the state of Windows files without saving your valuable data. If you make regular backups, you can turn off System Restore." I have two problems with this statement. First, System Restore was not designed to back up your data. Rather it was designed to restore your system *without harming your data*. Second, you should *not* turn off System Restore, even if you make regular data backups. Having data backups will *not* help you if a change to your system causes a disaster.

I've also heard computer radio show hosts advise people to disable System Restore to save hard drive space, as each Restore Point consumes about 50MB of space. That's like saying, "Don't carry a spare tire because it takes up space in the trunk." You can control the percentage of hard drive space to reserve for Restore Points. The installed default is 12% or 200MB, whichever is bigger, but you can reduce this percentage. If you allow a percentage that equates to a gigabyte, you should have room for about 18 Restore Points. In these days of monster hard drives, this does not seem like a major sacrifice for a security blanket. (Also, when the space consumed by Restore Points approaches the specified maximum, Windows automatically purges the oldest Restore Points to make room for fresh ones.)

If you still need a reason not to disable System Restore, consider this: Microsoft is integrating what users previously thought of as standalone components into the latest versions of Windows, making it impossible to remove some components through Add/Remove Programs. For example, if you upgrade to Windows Media Player 9 in WinMe/XP, there is no uninstall function should this upgrade behave badly for you. If you do not have a backup of your hard drive, you must use System Restore to get back to your earlier version of Media Player.

Limitations Of System Restore

System Restore is not a panacea. It won't help if a virus trashes your computer, or if your hard drive fails. Nor does it undo BIOS (Basic Input/Output System) or firmware updates if they happen to harm your computer, because those are burned into chips on the motherboard or hardware device. And System Restore is most useful if you notice a problem promptly, because it undoes *all* changes made to your system since the last time a Restore Point was made. ■

BY ALAN LUBER

Alan Luber is an author and computer expert. His new book, "PC Fear Factor: The Ultimate PC Disaster Prevention Guide" (Que Publishing), provides an in-depth look at disaster prevention and recovery. To learn more about the book or to contact Alan, visit his Web site at http://www.pcfearfactor.com.

CD-R
DVD-RW
DVD-R
CD-RW
DVD-RAM
control
Panasonic DVD Multi Drive.
Now you can read and write
data and life's moments to
DVD-RAM, DVD-R, DVD-RW,
CD-R and CD-RW.
Capture, Edit, Burn.
Control your media, control your life.
Panasonic
DVD MULTI
RECORDER
Panasonic
ideas for life
For DVD Multi Drive ideas visit us at: www.panasonic.com

Clash Of The Antivirus Apps

One Head Is Better Than Two

ONE OF THE GREAT THINGS ABOUT PCs is that they let users try several applications of the same type simultaneously. Don't like your Web browser? Install a different one and test it alongside the old one. This would seem to be a great idea with antivirus applications because running two or more on the same PC should catch more viruses, right?

Wrong. Antivirus applications are like PC guard dogs, sniffing around for suspicious intruders and ripping them to shreds before they can damage your files. Unfortunately, the only thing they hate more than viruses is other antivirus applications. Antivirus software works at a very low level to do its job properly; it snoops in portions of Windows, memory, and other places where high-level programs, such as Web browsers, dare not go.

When two antivirus programs start prowling around, all sorts of problems happen, ranging from program crashes to system lockups. Because these programs typically remain on all the time, they generally load as soon as Windows boots, which means if you install more than one antivirus application on your PC, both programs load automatically and lock up the system before there's a chance to troubleshoot.

To see what happens when two antivirus packages run at the same time, we tested two popular brands: Symantec's Norton Internet Security 2003 ($69.95; http://www.symantec.com) and McAfee's VirusScan 7.0 ($59.95; http://www.mcafee.com). Both are excellent products that are updated often, and either would be a fine choice to protect a PC from viruses, but they don't like one another.

We installed the Norton Internet Security suite, which includes Norton AntiVirus 2003, and patched the software to the latest version using the online updater. We rebooted the PC, and the utility suite ran as advertised, loading automatically when Windows started and running periodic antivirus sweeps in the background.

We then installed McAfee VirusScan 7.0 on the same system while Norton Internet Security was running. No alert boxes warned us to a potential conflict, although McAfee representatives say the product is designed to look for other antivirus products and tell the user to uninstall the competing application before proceeding. We never received a warning message on our Windows XP test machine, but that may have been due to an unusual system configuration.

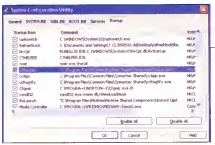
When Antivirus Apps Collide

We updated VirusScan 7.0 to its latest version using McAfee's online service. When prompted to reboot, we did, and Windows seemed to load normally, but it locked up a few seconds after the Desktop appeared. We couldn't shut down properly, and we had to use the reset button to perform a hard reboot. Each time Windows booted, the two antivirus products conflicted with one another enough to lock up the machine, putting us in a seemingly endless loop.

When we first installed McAfee VirusScan 7.0 and then installed Norton Internet Security 2003, the latter program generated a warning during setup, saying another antivirus program was running on the PC and recommended that we uninstall that software before proceeding with the Internet Security 2003 installation. When we ignored the warning, the suite attempted to install itself, but the PC froze partway through, necessitating a hard reset. After the PC rebooted the Windows Desktop appeared, and we had temporary access to the mouse cursor, but the antivirus component of Norton Internet Security had managed to install itself before the hard reset and once it and McAfee VirusScan had time to load, the PC froze again.

Break Out Of The Loop

When this happens, boot into Safe Mode, which prevents most drivers



Expanding the Command column in the Configuration Utility is a great way to find antivirus-related applications that load automatically.

from loading and keeps the two antivirus programs from launching when Windows starts up. Reset or turn on the PC and repeatedly press the F8 button on the keyboard until a boot menu appears. Use the arrow keys to highlight the Safe Mode option and press ENTER to continue the boot process. If you access the Internet using a home network, try to use Safe Mode With Networking; this may let you access the Internet for help while troubleshooting. Otherwise, the only tools you'll have are the documentation that came with the antivirus software and this magazine.

Safe Mode may let you in Windows, but it has a few quirks that hamper troubleshooting. It's impossible to use Add/Remove Programs to uninstall applications in Safe Mode. That's counterproductive in a situation like this where it's imperative to remove one or both of the conflicting applications, but we did discover a workaround.

We needed to prevent the two antivirus applications from loading while Windows started so Windows could boot normally and we could uninstall one or both of the antivirus programs. Boot into Safe Mode, click Start, click Run, type **msconfig** in the text box, and click OK. Click the Startup tab and look in the Startup Item list for entries that relate to Symantec, Norton, or McAfee. It may be necessary to expand the Command column to see this information, so place the mouse pointer on the vertical bar between Command and Location so that the pointer changes into a vertical bar crossed by a horizontal double-headed arrow. Hold down the left mouse button and drag the bar to the right until all the text strings in the Command column are visible and look for the words "McAfee," "Norton," "Symantec," or whatever the manufacturer or name of your antivirus product is. Click the boxes next to these entries to remove the check marks, click Apply, and then click OK. Reboot your computer so that it starts normally, and Windows shouldn't lock up anymore. Now you can remove any of the antivirus products according to the instructions that came in the box.

If you can't find the documentation, look for an uninstall option in the program's entry in the Programs list (click Start and then Programs or All Programs in WinXP). If none exists, click Start, expand Settings, and click Control Panel. In WinXP, click Start and click Control Panel. Double-click Add/Remove Programs (Add Or Remove Programs in WinXP) and find the entry for the software on the list. Click the entry to highlight it, click the Remove button, and then follow the prompts.

If you see this warning message when installing an antivirus application, heed it.

Add/Remove Programs tends to leave quite a bit of junk in the **Windows Registry**, a database containing all hardware and software settings that are essential to Windows' operation. If the program was uninstalled but rogue Registry entries cause errors or crashes that seem related to the removed software, McAfee offers step-by-step instructions for manually removing all traces of its products from a computer. For McAfee VirusScan, go to http://www.mcafeehelp.com, select the version you use from the Product Or Topic drop-down menu, and select Install/Uninstall in the Category drop-down menu. Choose an FAQ from the list and carefully follow the instructions; many of them involve manually editing the Registry, which can have disastrous consequences if you delete or modify the wrong entry.

Symantec has similar information, but it's tougher to access. Visit http://www.symantec.com/techsupp, click Search, type **uninstall** in the text box, and click Search. Scroll through the list until you find an article that corresponds to the version of Norton AntiVirus you use, click the link, and then carefully follow the instructions.

Turn Back Time

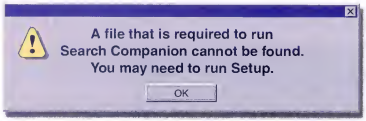
If you use Windows Me or WinXP Home or Pro, try using the System Restore utility to move Windows back to the configuration it was in before you installed the second antivirus application. Those versions of Windows automatically create an Installation Restore Point when McAfee VirusScan, Norton AntiVirus, or nearly any other antivirus application is installed on the PC. If you can get into Windows normally or via Safe Mode, click Start, then Programs, Accessories, System Tools, and System Restore. Choose Restore My Computer To An Earlier Time, click Next, and click the date on the calendar that the antivirus application was installed. Click the appropriate entry in the list on the right if there's more than one available, click Next, and follow the prompts to complete the procedure.

If your computer won't boot but you can press F8 to get to the boot menu, look for the Last Known Good Configuration entry. Highlight it and press ENTER and Windows will revert to the last Restore Point it created. The best way to avoid trouble is to not install two antivirus programs on the computer in the first place, but at least you know the latest versions of Windows are looking out for your interests. ▮▮

BY TRACY BAKER

Examining Errors

Any time you connect something to your PC, the possibility of potential errors increases. That goes double for cameras that rely on special software to interface with the PC, as you'll see in one of this month's errors. We also looked at a Web cam error message, a hard drive error, and a few application-related errors.



The Problem: A reader with a Kodak CX4300 digital camera sees an error message when he connects his camera to the USB (Universal Serial Bus) port on his PC. The message reappears when he attempts to clear it, but it doesn't prevent him from sending pictures from the camera to the PC. Once the camera's disconnected, everything's fine, and both the camera and the software it came with run perfectly as long as he operates them separately.

Error Message: "Image Error: An error occurred while updating the image data for drive x. This disk is either missing, full, or damaged."

You'll see this message if you're running Kodak's digital camera software while Norton Utilities is running on the computer. Kodak claims the error is preventable if users disable Norton Utilities before connecting the camera to the computer's USB port. The procedure varies depending on the version of the utility suite installed on the PC, so check the documentation or electronic help files for step-by-step instructions.

This might not work, and you may have to completely uninstall the Norton Utilities software to make the error message permanently go away. We don't recommend this, especially if you can still use the camera to send pictures to the PC; Norton Utilities provides several tools that you might want to keep. As long as it's possible to clear the error message and still access the pictures on the camera, you're in no way harming your computer, but if you're intent on permanently getting rid of the error, uninstall Norton Utilities in accordance with the directions that came with your version of the software.

Kodak says that users should not permanently disable or remove Norton AntiVirus (or any other antivirus product) to solve the problem. Because its connection software makes the memory card in a Kodak digital camera look like a hard drive to the PC, an antivirus program trying to scan the newly added drive may cause the problem.

We recommend temporarily disabling your antivirus product. If the message disappears when you connect your camera, contact the manufacturer for instructions or check the antivirus documentation to see if there's any way to make it ignore the digital camera. Because of the number of antivirus products available, we don't have the space to give instructions on configuring or temporarily disabling them.

Turn on your antivirus protection once you're finished working with the camera, as the computer is exposed to outside attacks from the Internet when the antivirus software isn't running. Consider shutting down any email software that's running on your PC as you work with the camera so no virus-infected email messages slip past while your antivirus software isn't looking.

The Problem: When a reader boots his Windows XP computer, an error message comes up several times listing different files. The PC reboots itself, and the process generally repeats. Occasionally, he's able to access Windows.

Error Message: "Delayed Write Failed: Windows was unable to save all the data for the file 'X.' The data has been lost. This error may be caused by a failure of your computer hardware or network connection. Please try to save this file elsewhere."

A number of things could cause this error, and it's important to fix it as soon as possible because Delayed Write Failed errors can corrupt files. Certain motherboards are prone to this error; determine what make and model of motherboard the PC uses and contact the manufacturer or visit the manufacturer's Web site to see if a BIOS (Basic Input/Output System) upgrade is available. The BIOS controls all the low-level operations of the PC and needs to be upgraded occasionally to maintain compatibility with new hardware. You can generally upgrade your BIOS using a process called flashing, where you download a patch to a floppy diskette, insert the floppy into the floppy drive, and reboot. The new file loads from the

floppy directly into the BIOS, replacing the older BIOS code to add new features and compatibility enhancements. Problems during flashing can render your computer unbootable, in which case you'll have to make an expensive motherboard replacement, so follow the upgrade instructions carefully.

If there's not a BIOS upgrade available or installing one doesn't fix Delayed Write Failed problem, disable Windows XP's write caching. Modern hard drives are equipped with RAM chips where frequently accessed pieces of data from the hard drive are temporarily stored. The computer can access data in RAM millions of times faster than it can access a piece of data on a magnetic hard drive platter, so turning on drive caching can dramatically boost hard drive and overall system performance.

Unfortunately, not all PC configurations work well when write caching is enabled, and the data stored in the hard drive's small RAM banks becomes corrupted, stalling the PC and generating errors. It's then a good idea to disable write caching to increase stability at the expense of performance. If you can get WinXP to boot, click Start, right-click My Computer, click Properties, and choose the Hardware tab. Click Device Manager and expand the Disk Drives entry by clicking the plus sign (+) next to it. Right-click the name of the drive that's causing trouble, click Properties, and select the Policies tab. Remove the check mark from the Enable Write Caching On This Disk checkbox and select the Optimize For Quick Performance radio button if it's available. Click OK and reboot if necessary.

If that doesn't work, there's a chance that the hard drive itself is failing. If it is still under warranty, consider asking for a repair or replacement. At the very least, try to install the drive on another computer to see if it generates the same error messages.

The Problem: Each time the user's Windows XP computer boots, it generates an error message. Closing the error message lets the computer continue working normally, but each time it's reset, the error reappears.

Error Message: "Cannot determine capture window resolution. You must run the Configure program to set the video settings."

This reader likely has an Intel Web cam installed, and the software for the camera is attempting to load when Windows boots. If the software for the camera loads but the camera is disabled, you'll get the above error message.

Intel recommends the reader make sure the camera is installed properly and is enabled. You can either uninstall it and then reinstall it according to the instructions it came with or check the documentation to see how to enable the camera with the OS (operating system) you use. Because the program launches each time Windows boots, preventing it from launching also will get rid of the errors. Click Start, expand Program (All Programs if you use WinXP), and look for a shortcut to the Intel Web cam software in the Startup folder. Right-click the shortcut and click Delete to prevent it from loading.

As an alternative, click Start, click Run, and type **msconfig** in the text box. Click OK and select the Startup tab. Look for an entry that pertains to the Intel camera software (it varies depending on the version you use) and remove the check mark in the box next to that entry. Click Apply, click OK, and restart your computer when prompted.

The Problem: Occasionally when a reader opens his Hotmail account in Internet Explorer, he sees an error message. He believes that it may be related to running the Netscape and Microsoft Web browsers on the same PC, along with Microsoft Works Suite 2003, which he recently installed. He didn't get the error messages until he installed Works Suite.

Error Message: "Runtime Error: C:/Program files/Microsoft Office/Office 10/WINWORD.EXE. Abnormal Program Termination"

The error message cites Winword.exe, which is the main executable file Works Suite uses to launch Microsoft Word. The problem has everything to do with that software and nothing to do with Internet Explorer, Netscape's browser, or Hotmail. We removed a program called Works Suite Add-In For Microsoft Word, which is installed with Works Suite. Click Start, expand Settings, click Control Panel, and open Add/Remove Programs (in WinXP click Start, click Control Panel, and click Add Or Remove Programs). Find the Microsoft Works Suite Add-In For Microsoft Word entry, click it, click Remove (Change/Remove in WinXP), and then follow the prompts to uninstall the software. ▮

BY TRACY BAKER

Have questions about an error message you've seen? Send us your message (errormessages@smartcomputing.com) and we'll try to decipher it. Tell us what version of Windows you're using, give the full text of the error message, and provide as many details in your explanation as possible. Volume prohibits individual replies.

Quick Fixes

Transcriber 1.51 For Pocket PC

This free utility will boost the handwriting recognition capabilities of your Pocket PC. The Transcriber helps your PC understand printed and cursive characters (or a mixture of both), and it deciphers even messy handwriting. To download the software, type the URL (uniform resource locator) below, and from the Product/Technology drop-down menu, select Pocket PC Software. Click Go and from the Sort Results By menu, select Date and click Go. Scroll through the search results and click the Transcriber 1.51 For Pocket PC link. At the bottom of the page, you will see three links to the 4MB files you need for the Transcriber: TranScriberCE_e.exe, TranScriberCE_f.exe, and TranScriberCE_g.exe. Click each link, wait for the file transfer to complete, and move on to the next file. ◆

http://www.microsoft.com/downloads

ScanSoft OmniForm 5.0

You will want to install this patch if you encounter poor printing performance in this program on a computer running Windows XP/NT 4.0/2000. To download the 1.4MB update, type the URL below. From the first drop-down menu, select OmniForm and from the second drop-down menu, select your computer's OS (operating system). Click Submit Information, scroll down, and click the link titled OF5printDriverUpdate.exe. Double-click this file to install the patch. Be advised that you should not install this update on systems running Windows 98 or Windows Me. ◆

http://support.scansoft.com/downloads

Hewlett-Packard Photo And Imaging AOL Version 8.0 Update

A number of HP's Scanjet scanners use the HP Photo And Imaging software, which includes a Send To Email feature. This update will help the Send To Email feature work with AOL version 8.0. You should install this fix only if you use AOL and the Send To Email feature doesn't work or causes a File Not Found error. To see if the update works for your Scanjet, type the URL below, type Scanjet in the Enter Model Product Number text box, and press ENTER. Scroll through the list of results and click the Drivers & Downloads link next to your model. Click the link for your OS and if you see it listed, click the link titled HP Photo And Imaging AOL Version 8.0 Update. Click Download Now, and after the file transfer, double-click the downloaded file to install the 185KB update. ◆

http://welcome.hp.com/country/us/eng/software_drivers.htm

Peachtree Accounting 2003

This update will repair a problem with recurring messages reminding you to renew your support contract. To download the 226KB update, type the URL below and click the link titled Peachtree Accounting 2003 Update. After your computer saves the update, double-click the file (Paw1011Tk.exe) to begin the installation. Once you've installed this update, the program will display a message confirming your choice to display renewal messages only one at a time. ◆

http://www.peachtree.com/html/PCW_product_update.cfm

Internet Explorer 6 Update

You may see truncated data in that Excel spreadsheet you downloaded using Internet Explorer 6. However, this problem occurs only if the file used Gzip-encoded compression. You can repair the bug with this 345KB update. To download the file, type the URL below, and from the Product/Technology drop-down menu, select Internet Explorer. Click Go, and from the Sort Results By menu, select Date and click Go. Scroll through the list of results and click the link titled Internet Explorer 6 Update: Data Is Truncated When You Download A Gzip-encoded Excel File In Internet Explorer. Click Download to save the file to your computer and then double-click the file (q331596.exe) to install the patch. ◆

http://www.microsoft.com/downloads

Fix Of The Month

Windows 2000 Security Patch

Microsoft recently identified a weakness in Windows 2000 that could let a cracker take complete control of a PC running this OS, though only if the cracker has physical access to the targeted PC. You can protect your Win2000 PC with this 5.3MB patch. To download the update, type the URL below, and from the Product/Technology drop-down menu, select Windows 2000. Click Go and from the Sort Results By menu, select Date and click Go. Scroll through the list of results and click the link named Windows 2000 Security Patch: Buffer Overrun In Windows Kernel Message Handling Could Lead To Elevated Privileges. Click Download and once your computer saves the data, double-click the file to install the update. ◆

http://www.microsoft.com/downloads

Record. Edit. Mix. *Create.*

Desktop audio is more than just ripping MP3s.

cool edit

Take the next step.

Electronic Musician 2003 editors choice

BEST OF THE YEAR

Download your copy today from www.cooledit.com.
Oh, and Cool Edit rips MP3s too, if you're into that.

Syntrillium Software

P.O. Box 62255 | Phoenix, AZ 85082 USA | 1.888.941.7100 | tel: +1.480.941.4327 | fax: +1.480.941.8170 | sales@syntrillium.com | www.syntrillium.com
toll-free sales, USA and Canada

Q&A

Get straight answers to your technical questions from *Smart Computing*. Send your questions, along with a phone and/or fax number, so we can call you if necessary, to *Smart Computing* Q&A, P.O. Box 85380, Lincoln, NE 68501, or email us at q&a@smartcomputing.com. Please include all version numbers for the software about which you're inquiring, operating system information, and any relevant information about your system. (Volume prohibits individual replies.)

Need help with your hardware or software? Looking for simple explanations on technical subjects? Send us your questions!

Windows

Q: I tried the instructions in the "A Better BIOS" article in the March 2003 issue (page 78) of *Smart Computing* on an HP 6470Z computer with Windows XP Home. The startup on the upgrade gave a message "Cannot Flash When Memory Managers Are Present (EMM386)."

A: Your HP 6470Z, according to documents at the company Web site, may meet the minimum system requirements for upgrading from Windows 9x to WinXP, but everything about the computer, including some hardware drivers, may not be compatible with the newer OS (operating system). In other words, if you've upgraded your OS since you bought the HP 6470Z, you may be experiencing the problems mentioned on the Web site.

EMM386 is an upper memory manager that was an optional application under Microsoft DOS, the character-based system that preceded Windows. If you were running pure DOS, you could temporarily disable it (find the line invoking it in the DOS startup file, Config.sys). However, WinXP, like WinMe/2000, doesn't have a native DOS underlying it. These versions of Windows emulate DOS in a window if you need it for certain applications (such as games or old accounting packages, for example). But these emulated DOS sessions are not pure DOS, and this is what your BIOS (Basic Input/Output System) updater needs.

The workaround is to ask a friend who is still using Win98SE or earlier to make you a DOS system disk on a floppy diskette (when formatting, put a check in the Include System Files checkbox). This will let you boot your computer into DOS mode long enough to update your BIOS.

But perhaps you might want to hold that thought for a moment. HP's online documents don't mention the problem with its BIOS updater, so there may be a reason not to upgrade your BIOS if you've already moved to WinXP. If we were contemplating this action, we'd write a note to HP's tech support folks or call HP's tech support and talk it over. Go to http://www.hp.com, click Support And Drivers, then HP Software And Drivers, and then type your model number. On the subsequent page, one option should include information about contacting Hewlett-Packard.

Q: I recently upgraded from WinMe to WinXP, and now I can't find the Clipboard and Clipboard Viewer listed under Accessories. How can I get them back?

A: Among the many changes under WinXP's hood was the conversion of the Clipboard from a standalone application invoked by individual applications to a service. Services are programs that Windows starts, running unobtrusively in the background waiting to lend assistance. Depending on how you upgraded, the Clipboard service may not have been installed.

To see if the Clipboard service was installed, click Start and then Run and type **clipbrd** in the Open: field. Click OK and if Clipboard was installed, the viewer should launch after a moment. If you see an error message saying, "Windows Cannot Find Clipbrd," click OK and proceed with the following steps.

To install Clipboard, click Start, Control Panel, and Add Or Remove Programs. Click Add/Remove Windows Components and double-click Accessories And Utilities. Double-click Accessories and click the checkbox for Clipboard Viewer. Click OK twice and then Next. Depending on how you upgraded to WinXP, you may be prompted for the Windows XP installation disc. After the Windows Components Wizard finishes installing, click Finish.

Test the installation by repeating our previous steps to launch the Clipboard Viewer. If you want to create a shortcut to the viewer, right-click the Desktop, select New and then Shortcut, type **clipbrd** and then **Clipboard Viewer** as the shortcut name. Click Finish and the Clipboard Viewer icon will be accessible from your Desktop.

Learning Series & Encyclopedia *Special Issues From* Smart Computing

Learning Series

Each month, the *Learning Series* takes one topic and offers 148 pages of in-depth coverage, including all the tips, tricks, and troubleshooting information you could need. The unique articles walk you step-by-step through each application.

L0905

L0904

L0903

L0902

L0901

L0812

L0811

L0809

L0806

L0803

Just $5.95 Each
Includes Shipping!

All Past Issues Are Available Free To Subscribers At www.smartcomputing.com

5-Volume Encyclopedia Set

Organized, Easy To Use And In Plain English

The *Computing Encyclopedia* brought to you by *Smart Computing* delivers more Plain-English explanations of computing terms and technologies than you could ever expect to accumulate in a lifetime. Designed to be easily stored next to your PC, and referred to for years to come, the *Computing Encyclopedia* is your all-in-one resource for computing facts and information. Over 1100 fully illustrated pages! Set of 5 Including gold-embossed slipcase **$29.95**

Encyclopedia Order Form

Get All 5-Volumes (sold individually for $9.95 each) PLUS a gold-embossed slipcase to organize and protect your investment ($9.95 value) *A total $59.70 Value.* Your Price JUST **$29.95** Shipping Included!

Number of Sets _____ x $29.95 Order Total:_____

Learning Series Order Form

Issue Number	Quantity	x Price	Total
_____	_____	x $5.95	_____
_____	_____	x $5.95	_____
_____	_____	x $5.95	_____
_____	_____	x $5.95	_____
_____	_____	x $5.95	_____
_____	_____	x $5.95	_____

Order Total:_____

Reference Series Order Form

See Issues Listed On Back Side Of This Form

Issue Number	Quantity	x Price	Total
_____	_____	x $9.95	_____
_____	_____	x $9.95	_____
_____	_____	x $9.95	_____
_____	_____	x $9.95	_____
_____	_____	x $9.95	_____
Reference Binder	_____	x $12.95	_____

Order Total:_____

Name _____

Company _____

Address _____

City/State/Zip _____

Phone _____

E-mail _____

Payment Method:

[ ] Check [ ] Money Order [ ] Visa
[ ] MasterCard [ ] American Express [ ] Discover

Credit Card Number Expiration Date

Signature

Total Invested

$

Payment Must be Included

Shipping Included To US & Canada

Prices in US Funds Includes GST #BN123482788RT0001

Credit Card Orders Call (800) 733-3809 *or* Order by mail with this form
Allow 2 weeks for delivery

Reference Series *Special Issues From* Smart Computing

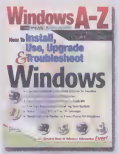
Smart Computing's Reference Series issues are the ultimate all-in-one resources for computing facts and information. Each issue is designed for you to take home, put next to your PC, and refer to for years to come. You'll find full-color illustrations and in-depth articles, along with historical facts and figures, all designed to help you make sense of computers and the Internet.

Special Gold Embossed Reference Binders

The perfect way to protect and organize your computing reference library!

Just $12.95 Each

Just $9.95 Each Includes Shipping!



R0702

R0701

R0608

R0607

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 10 LINCOLN NE
POSTAGE WILL BE PAID BY ADDRESSEE

SMART COMPUTING
PO BOX 82511
LINCOLN NE 68501-9806

Smart Computing® smartcomputing.com In Plain English

(800) 733-3809

See Order Form On Other Side

Q: I have two questions. First, can you delete the entire contents of My Documents or My Pictures from my Win98 system without deleting the whole folder? I have lots of photos in both, and I recently deleted the contents of My Pictures by deleting each photo one at a time. Second, I was visiting a Web site and noticed that a shortcut to the Web site appeared on my Desktop. When I tried deleting the shortcut icon, an error message said, "Cannot Be Deleted, File Too Long." When I tried to rename it, the message appeared again. I was told I may have to go and delete it from the Registry, but I'm not sure I want to fool with that. Is there an easier way to delete this?

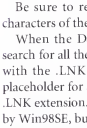
A: Cleaning up folders and directories on Windows can be troublesome if you don't know a few keyboard shortcuts. To delete the entire contents of a folder, first open the folder and highlight one file with your mouse. Next press CTRL-A on your keyboard. This will select all of the files in the folder, and you can either drag them to the Recycle Bin or right-click and click Delete from the context menu. If you don't want to remove all of the files, follow the same procedure previously outlined but before deleting the files, click the ones you want to keep while holding down CTRL-A. This will deselect the files you want to save.

To delete the troublesome shortcut, you'll need to open a DOS window and use the Del command. The key is an old DOS trick known as a "wildcard." To delete an annoying shortcut from an unfriendly Web site that doesn't want to be deleted, type:

del "c:\windows\desktop\Annoying*.lnk"

Be sure to replace "Annoying" with the first eight characters of the shortcut.

When the Del command reads the asterisk, it will search for all the files starting with Annoying and ending with the .LNK extension. Think of the asterisk as a placeholder for all of the text between Annoying and the .LNK extension. These long file names can't be displayed by Win98SE, but using the wildcard technique will overcome this limitation.



Online

Q: I'm about to buy two new computers, but I've never had one before. When I get the computers, I want to hook both to the same Internet connection. Can I do this?

A: Yes, you can. The method and cost will be different depending on what version of Windows you have. It will also depend upon whether you have a standard POTS (Plain Old Telephone System) dial-up modem or broadband (such as high-speed cable, DSL [Digital Subscriber Line], or ISDN [Integrated Services Digital Network]), or some other service.

To share your Internet connection requires that your computers be networked, but the next set of variables depends on how you network your computers. For example, you could use wired Ethernet with or without a hub/switch, wireless Ethernet, Home Phoneline, HomePlug, or some weird mixture through a bridge device.

Then we have to discuss whether to use just software, such as Microsoft's Internet Connection Sharing or a similar product, or whether it makes more sense to use a hardware gateway/router (and whether your ISP [Internet service provider] will let you do that free).

We wish we could discuss all of these options and alternatives with you here in depth, but, alas, there wouldn't be room for much of the rest of the magazine. Instead, we'll briefly outline two of the more popular ways to share an Internet connection.

We're going to assume you'll have some form of high-speed Internet (either xDSL or cable). The least expensive way to share this connection uses Microsoft's ICS (Internet Connection Sharing). The computer connected to the high-speed modem must be running Win98SE or later to get Microsoft's ICS, or you'll have to buy a third-party Internet sharing software. For our purposes, we'll assume you have Microsoft's ICS.

Even though you have only two computers, you'll need three Ethernet NICs (network interface card; as little as $10 each). Two of the NICs go in the computer connected directly to the Internet. The other NIC goes in the remaining system. You'll also need one Category 5 Ethernet crossover cable, so called because one of its twisted pairs of wires is cross-wired between the connectors. The cable must be long enough to stretch between the two computers. If they're in different rooms, you may also be looking at some minor renovations. Note also that a crossover cable works if you have only two computers. Three or more will require the addition of a hub or switch through which the units will be connected.

The process is as follows. Get the computer that will be attached to the high-speed modem up and running and successfully connected to the Internet and then leave the 'Net alone for a while. The modem will connect to one of this computer's two NICs.

Connect the other NIC, via the crossover cable, to the other computer. Establish the network between the two computers, using TCP/IP (Transmission Control Protocol/Internet Protocol) as the communications protocol between them (not IPX/SPX [Internetwork Packet Exchange/Sequenced Packet Exchange] or NetBEUI). Only once the two-computer network is functioning properly should you start the Internet sharing process (trying to do both simultaneously will make you crazy).

Next, install ICS, but only on the computer attached to the high-speed modem. You'll find ICS under the Windows Setup tab in the Add/Remove Programs applet in Control Panel (click Start, Settings, Control Panel; in WinXP, click Start and Control Panel). Depending on your version of Windows (Win98SE or later), it may be under Communications or Internet Services. During installation, you'll be asked to provide a blank, formatted floppy diskette, on which will be placed a small program used to set up the other computer(s) on your network. Other than the small applet on this floppy, you do not install ICS on any other computer on the network; it's only installed on the unit directly connected to the Internet. During the ICS install, you'll be asked which of the two NICs in the host system is for the Internet and which is for your network. Once the installation is complete and you've run the applet on the floppy on the other PC, your Internet sharing should work without much problem.

Software-based connection sharing sounds complicated, but it's still a relatively inexpensive way to go about sharing.

A somewhat more expensive, but in our experience much simpler, way to proceed is to install a wireless Internet gateway/router using either Wi-Fi (IEEE 802.11b) or "Wireless G" (IEEE 802.11g). The gateway/router/wireless access points have dropped in price in recent months, in some cases to less than $100. Each computer also needs a wireless receiver (about $50) connected through a USB (Universal Serial Bus) port. They don't need a separate NIC. Look to companies such as 3-Com, Belkin, D-Link, GVC, Linksys, and others. In this instance, the software used to share your connection is in the router, usually along with a firewall for added protection. And you won't need to renovate your house if the computers are in different rooms (or on different floors).

Q: Following the instructions on page 63 in the "Restore IE's Default Animated Icon & Title Bar Text," in *Smart Computing*'s April 2003 issue, I tried to remove the "branding" by AT&T Worldnet Service. The title reads: Internet Explorer Provided By AT&T Worldnet Service. I used that service at one time, but I now have Comcast.net. Just having the title Internet Explorer would be sufficient. I went to the Registry Editor but could not find Window Title in the main listing. The first entry showed (Default) item with a [value not set]. But in the alphabetical list there was no Window Title noted. The only window item was Window Placement. Is there another way to remove the branding? I'm using Windows XP on a Dell Dimension 8200.

A: Comcast and AT&T Broadband merged in November 2002 to form the new Comcast, but your MSIE title bar still reads AT&T Worldnet Service. We're not sure why this isn't working for you, so we'll try the explanation again, just in case one of us missed something. ISPs regularly use a feature in Internet Explorer that lets them change the default name of the program as displayed in its Title Bar. For example, instead of Microsoft Internet Explorer, the name in the Title Bar could be set to read Microsoft Internet Explorer Provided By Joe's Internet Service.

To change, modify, or cancel the altered wording, you have to edit the Windows Registry, and that brings the obligatory warning to handle the Registry with care. Before changing the Registry, become familiar with how to back it up and restore from the backup in case something goes wrong.

To start the Registry Editor, click Start and Run and type **regedit** in the Open field; press ENTER or click OK. You'll find the full procedure to protect and restore the Registry under Help on the Registry Editor's menu bar.

To return the IE bar to its default title, you'll need to delete the modified title. Go to the following Registry key: HKEY_CURRENT_USER/SOFTWARE/MICROSOFT/INTERNET EXPLORER/MAIN.

You may find the key by clicking Edit and Find and typing the name of the key into the Find What field, or you can navigate to it directly. Click the plus sign (+) beside HKEY_CURRENT_USER. Scroll down the list of keys in the left pane of the Registry Editor to SOFTWARE and click the plus sign. Continue looking in the left pane until you find MICROSOFT and again, click the plus sign. Continue scrolling in the left pane until you find INTERNET EXPLORER and click the plus sign. Find the MAIN folder and click it to reveal its contents in the right pane. Near the bottom of the list of values in the right pane, look for the value Window Title and see if the default Microsoft Internet Explorer title has been modified. Unlike a similar value for Outlook Express elsewhere in the Registry, this one has a space between Window and Title.

To restore the default Title Bar text, right-click the Window Title value and click Delete. Confirm your choice. If IE is open on your Desktop, it will not change. However, the next time you start IE, it will have reverted to its old title. Exit the Registry Editor.

To customize the IE Title Bar, find HKEY_CURRENT_USER/SOFTWARE/MICROSOFT/INTERNET EXPLORER/MAIN (as above).

If the value name, Window Title, appears in the right pane, double-click it (or right-click the name and select Modify). In the Edit String dialog box, type your text in the Value Data line. Click OK when you're done.

If the value name, Window Title, isn't in the right pane, create it. Right-click a blank portion of the right pane and select New and then String Value. A default value (String Value #1) will appear, highlighted. Type a new name, **Window Title** (with initial caps and a space between the

two words), and press ENTER twice to confirm the name and bring up the Edit String dialog box. Type your new text and click OK when you're done.

Any change you make in the Internet Explorer Title Bar will manifest the next time you start IE.

This Old Computer

Q: I have an Apple Personal LaserWriter LS and wonder if it's possible to connect it to my Dell Dimension XPS T500. Can I connect it to a network?

A: Unfortunately, the Personal LaserWriter LS is only compatible with Apple computers. It's possible to connect it to an Apple computer serving as a print server for your network, but in our opinion, this would involve a great deal of work for minimal gain.

When the LaserWriter was introduced in 1991, it was considered a high-end laser printer, sporting up to 300dpi (dots per inch) resolution and the ability to print up to 4ppm (pages per minute). At the time, this was quite respectable, as reflected in its retail price of $1,199. However, it relied upon a serial connection for receiving the print tasks or jobs. Compared to today's laser printers, it's relatively slow and prints at a lower resolution than many people are used to. Entry-level laser printers are available for less than $200 and have faster USB (Universal Serial Bus) connections, higher print quality, and the ability to easily print 10ppm. Our recommendation would be to sell the LaserWriter at an online auction site, such as eBay (http://www.ebay.com), and use the proceeds to buy a new printer.

Word Processing

Q: After I installed MS Word 2002 recently, I discovered that I couldn't edit any documents prepared with previous versions of Word without the computer crashing about two-thirds of the way through the second page of the document I was editing. I hear a loud sound, like a bass guitar string, then everything freezes. I can't even get back into Windows by using CTRL-ALT-DELETE. I have to manually shut off and restart my computer. I've reinstalled Word 2002 twice, with no change. What can I do to solve this problem? My operating system is WinMe, and the computer is an HP Pavilion XT936.

A: Without having a copy of one of the damaged documents (no, please, don't send us any), we can only guess at what might be causing the problem. If it were just one document, we'd suspect that it had become corrupted somehow, but if it includes all documents prepared with your previous version of Word, we suspect a corrupted template. The Word template, Normal.dot, contains the basic formatting for document structures, such as default page size, margins, fonts, and so on, but it may also house automation scripts (known as macros) that can be helpful or harmful. Other templates can be attached to documents, but because you don't describe yours, we'll continue on the assumption that Normal.dot is the culprit. We don't know if you've contracted a virus that has corrupted that old template or whether it was the result of bad programming on someone's part, but that's where we suspect the problem lies.

There may be some other way you can cleanse your documents, but there's a quick and dirty way, too. Open them in WordPad, first, then either cut and paste the text into a Word 2002 page or save them again from WordPad. You may save the document as a Word 6.0 document or as an RTF (Rich Text Format) document. An RTF file maintains your formatting and even pictures, but macros and other Word-specific code will be stripped out. Voila! Clean documents.

To get to WordPad, click Start, Programs, and Accessories and look down the list to find WordPad.

Miscellaneous Software

Q: I'm still using Quicken 8 for DOS. I first had it on my 286 a generation ago. It has stayed with me through my upgrades to 386, Pentium I, and Pentium II. After some effort, I have it working on my new Pentium 4 running WinXP Pro, but I can't get the report printer function to execute. Reports go the printer spool, but the printer, an HP 3150 multifunction machine, will not print them. Am I doomed to finally going to a Windows version of Quicken or is there some other remedy?

A: In the immortal words of Star Trek's Dr. McCoy, "She's dead, Jim." Our recommendation is to export your data files into QIF (Quicken Interchange Format), install Quicken 2003, and pray that they import properly. Although you've been able to keep Quicken on life support for an incredibly long time, you may be playing with fire. Most software vendors go to great lengths to maintain backward compatibility with older versions of their software, but eventually you'll be left stranded alongside owners of 8-track tapes, dot-matrix printers, and buggy whips. Unless the financial data you keep in your current version of Quicken is unimportant, we suggest you upgrade.

FAQ

Frequently Asked Questions

Answers to users' most common questions about

Device Drivers

FAQ: What is a device driver?

A device driver is a program that lets hardware components and peripherals interact with your computer. Every version of Microsoft's Windows OS (operating system) contains a number of device drivers that work in the background so you don't even have to pay attention to them. When you attach an ordinary keyboard or mouse, for example, you don't have to install drivers because Windows already includes them. With each new Windows version, Microsoft includes support for an increasing number of devices. Windows 3.1 came with a handful of generic drivers compared to Windows XP, which contains hundreds of drivers.

FAQ: How do you make sure you have the right driver for a particular device?

Most devices currently for sale at computer stores either include drivers on CD (or, less often, on a 3.5-inch floppy diskette) or don't require any special drivers at all. A typical device that works with Windows 95/98/98SE/NT/Me/2000/XP only requires that you install a driver if you're using it with Win95/98/98SE. This is because the more recent WinNT/Me/2000/XP OSes include an abundance of drivers. A few years ago, when Windows 3.1/95 were still popular, you could expect to install a driver from a diskette for all but the most common hardware components. If you've installed a device that doesn't work correctly, or that your computer won't even recognize, it's possible that it needs a driver or driver update. You can use the Device Manager to identify problems with a device. If you're using Win95/98/98SE/NT/Me/2000, click Start, Settings, and Control Panel; double-click the System icon; select the Device Manager tab; click the plus sign (+) next to the device type to expand the view and select the appropriate device. If you're using WinXP, click Start and Control Panel; double-click the System icon (if necessary click Switch To Classic View first); select the Hardware tab; click the Device Manager button; click the plus sign next to the device type to expand the view and select the device. A yellow circle with an exclamation point indicates that there's a problem communicating with the device.

FAQ: How do you update drivers?

If it looks like a driver update is in order, first determine whether there's already a better driver on your computer. Use the instructions in the previous paragraph to open the Device Manager. If you're using Win95/98/98SE/Me, select the appropriate device, click the Properties button, select the Driver tab, click the Update Driver button, and follow the on-screen instructions. If you're using WinNT/2000/XP, right-click the appropriate device and select Properties, select the Driver tab, click the Update Driver button, and follow the on-screen instructions. If this doesn't net a better driver, visit the manufacturer's Web site or call its technical support number to see if an update is available. You can also try the Microsoft Download Center (http://www.microsoft.com/downloads). Click the Drivers link under Download Categories and use the Search For A Download fields to locate a driver. The Windows Update program, available to Win95/98/98SE/NT/Me/2000/XP users with an active Internet connection, often turns up downloadable drivers, as well. You can also consult Web sites, such as DriverGuide.com (http://www.driverguide.com) and WinDrivers.com (http://www.windrivers.com), to find downloadable drivers, but some driver sites charge a fee.

FAQ: How do you install drivers?

After you download a driver or insert a diskette or CD containing a driver, open Device Manager and click the Update Driver button. Your PC should then automatically find and install the new driver. Win3.1 doesn't include Device Manager, but you can install drivers from a diskette. To do this, open the Program Manager (Main) window, double-click the Control Panel icon, double-click the Drivers icon, click Add, under List Of Drivers select Unlisted Or Updated Drivers, click OK, select the A:\ drive, locate the driver on the diskette, and click OK.

Refurbished Does Not Mean New

ACTION EDITOR

Are you having trouble finding a product or getting adequate service from a manufacturer? If so, we want to help solve your problem. Send us a description of the product you're seeking or the problem you're having with customer service. In billing disputes, include relevant information (such as account numbers or screen names for online services) and photocopies of checks. Include your phone number in case we need to contact you.

Letters may be edited for length and clarity; volume prohibits individual replies.

Write to:
Action Editor
PO Box 85380
Lincoln, NE 68501-5380

Or send **email** to:
actioneditor@smartcomputing.com

Or **fax** us at:
(402) 479-2104

I bought a new Dell PC, and after five months, I have a system that's almost entirely refurbished parts. Dell has replaced three monitors, a power supply, and the motherboard and CPU. Twice, the company promised me new parts to fix the various problems; none of the representatives mentioned that repairs might be made using refurbished parts. In addition, some of the refurbished parts, such as the hard drive, didn't work well right after they were installed and the preinstalled software on this drive didn't work properly, either. I could've bought a used system for less than half of what I paid Dell for this "new" system. All I want is the new system.

Robert Tucker
Helena, Ark.

We emailed Dell's support team to see if they could help Robert get the new PC he paid for. Two days later, a Dell representative responded and said she had spoken to Robert and agreed that a new PC was the best way to resolve Robert's problems. Robert emailed us five days later to say that he had received the new computer, which had a few extras thrown in free, and that the system was working flawlessly.

My children bought me an HP Photosmart 7550 printer for Christmas. Since then, I've tried and failed to use four of these printers. When I tried to install the first, my PC went into Safe Mode. I called an independent repair technician, and even he failed to get the printer to work on two other PCs. I returned the printer to Best Buy and picked up a replacement. This printer also caused my PC to go haywire, and an HP technician said the printer was defective. Best Buy again replaced the printer, but the third printer screwed up my PC and, needless to say, so did the fourth. Why can't anyone at HP help me install this printer?

Joan Fleischer
Lanoka Harbor, N.J.

We emailed a spokesperson at Hewlett-Packard to see if she could help us untangle Joan's printer mess. We received a response on the same day, and Hewlett-Packard promised to help. Joan emailed us 10 days later to say she had received yet another printer, this time with instructions to call a senior Hewlett-Packard technician, who would walk Joan through the installation process. Five days later, Joan said the technician had been unable to install the printer and told Joan that the simplest solution might be to upgrade from Windows Me to Windows XP. Because her computer was a little slow, Joan decided to buy a whole new system, and when she attempted to install the printer, it worked fine.

Six months ago, I bought a Volcano 7 CPU cooling fan from Thompson's Computer Warehouse. The fan worked well for about a month and a half, at which point it began shutting off intermittently. Eventually the fan was moving so little air that my computer would sometimes do an emergency shutdown to prevent overheating. I contacted TCW a number of times to get a replacement, but the company referred me to the manufacturer, Thermaltake, to request another fan. I emailed Thermaltake several times, but months later, no one has responded and I still don't have a working fan. Can you help?

Matthew Johnson
Tampa, Fla.

We emailed Thermaltake's site to see if anyone could help Matthew. Three days later, we received a response from a technician in the service department, who requested more information. We sent all of Matthew's previous email correspondence with the companies to the technician. Two weeks later, Matthew received his new fan, which is working fine.

Sounding Board

Each month, we give voices in and around the computing world a chance to sound off on topics that matter to everyday users.

"The most important things for consumers to look for when selecting an ISP should be reliability of the service and price. Internet access has become a commodity, and people realize that it doesn't matter what entrance ramp (ISP) they use to get on the Internet highway; what does matter is reliability and price and the ability to roam freely once they're online. The walled garden approach to the Internet was for the first-time user and is a thing of the past. Today, we believe consumers want easy access to the Internet to check news, stocks and scores, send email, shop online, and not pay an arm and a leg for it."

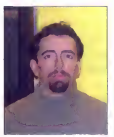
—Mark R. Goldston, chairman, CEO, and president, United Online, marketers of NetZero, Juno, and BlueLight Internet services

"If a person is an experienced Internet user, they will know what's important to them when looking for an ISP. Some people appréciate (in fact, need) the user interface provided by AOL; others appreciate the flexibility they get from a traditional Internet software client. Still others want to know they can find a support technician who provides quick and accurate answers. Travelers need to know they can get access from wherever they are, but gamers are interested in low latency, high-speed connections.

Less experienced users have their own unique needs. Most new users don't know what they don't know. Find an ISP whose technicians understand the language you speak and can provide accurate, effective answers to the questions you pose."

—Dan Hunt, president, HunTel Systems

Q: *What is the most important thing to look for in an ISP?* Is it ease of use? Access to troubleshooting help? Proprietary content? Access to local phone numbers while traveling?



"Selecting the right ISP depends on what type of user you are. If you're an occasional user who just wants to access the Web and send email, then most ISPs offering dial-up connections will suffice. Most offer reliable, inexpensive access. If you're a more active user, such as a business user or frequent visitor to graphics rich ecommerce sites, access speed becomes critical.

Broadband access is growing very rapidly; for instance, the number of U.S. homes using broadband Internet will grow 40% in 2003 to reach 25 million, according to Strategy Analytics (2/3 cable, 1/3 DSL). Same type of growth in Europe, the Middle East, and Africa (but 1/2 cable, 1/2 DSL: Yankee). Today's DSL or cable broadband offerings provide the kind of access speed required for heavy Internet users. In these cases, people might look at customer support, speeds, and price as their primary criteria."

—David Oram, Telco Industry business manager for Sun Microsystems

"There are really three important things: Accessibility: Can you get on the Internet without constant busy signals? Technical Support: Having 24 hours a day, 7 days a week personal tech support with minimal wait time is vital and a sign of quality customer service. And ease of use: ALLTEL strives to make it easy for customers to sign onto the Web and get the information they need with quick connections and the ability to personalize home page content from a variety of sources."

—Darren Decker, director of ALLTEL Internet Services

"Your ISP needs depend on your Internet lifestyle. If you are an experienced user, you may want an ISP that will not install proprietary software on your computer, and you will probably want broadband, which will limit your options. If you are new to the Internet, you will want a company that can provide good customer service, and you may want software that will carry you through the configuration process. In either case, do not ignore local ISPs in favor of nationwide advertisers, especially in suburban and rural areas, because they may be able to provide better service (in terms of busy signals and actual download rates) and should have far better customer service. For most people, the primary purpose of an ISP is to provide email, so you will want to be able to get to your email during busy times, and you will want virus and spam protection. If you travel, you will also want Webmail access, a dial-up number, or 800 number access. In many cases, an 800 number is available even though it is not advertised."

—Alex Goldman, associate editor, ISP-Planet
(with help from Ted Stevenson, executive editor and founder, ISP-Planet)

Discover why eMachines is for everyone.

From high-performance features, outstanding reliability, and some of the best prices you'll find anywhere, to our award-winning customer service, eMachines truly is for everyone.

The Power of Reliable Partners
The Intel® Celeron® processor delivers reliability and compatibility while offering good performance for today's most widely-used applications. Intel is the world's leading microprocessor company.

Microsoft® Windows® XP delivers reliability and performance. Explore it now! Do Amazing Things with Windows XP and your new eMachines PC.

emachines
eMachines is for everyone

T2240

- Intel® Celeron® Processor 2.20 GHz
- 128 MB DDR
- 40 GB Hard Drive
- 48x Max CD-ROM Drive
- 10/100 Mbps Ethernet Built-in
- 6 USB 2.0 ports
- **Microsoft® Windows® XP Home Edition**
- 6 month AOL membership included[1]
- Norton AntiVirus™ 2003[2]

$399.99

T2245

- Intel® Celeron® Processor 2.20 GHz
- 256 MB DDR
- 40 GB Hard Drive
- 40x Max CD-RW Drive
- 16x Max DVD Drive
- 10/100 Mbps Ethernet Built-in
- 6 USB 2.0 ports
- **Microsoft® Windows® XP Home Edition**
- 6 month AOL membership included[1]
- Norton AntiVirus™ 2003[2]

$499.99

T2385

- Intel® Celeron® Processor 2.30 GHz
- 512 MB DDR
- 80 GB Hard Drive
- 48x Max CD-RW Drive
- 16x Max DVD Drive
- 10/100 Mbps Ethernet Built-in
- 6 USB 2.0 ports
- **Microsoft® Windows® XP Home Edition**
- 6 month AOL membership included[1]
- Norton AntiVirus™ 2003[2]

$599.99

intel inside
celeron

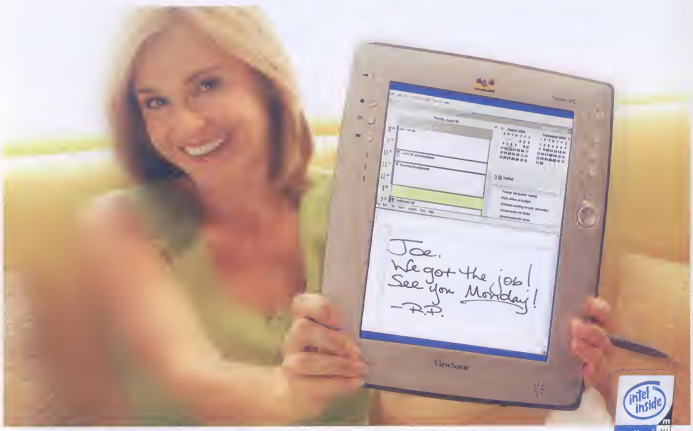
Microsoft Windows XP

www.emachines.com/sc or 1-866-824-6463

eMachines recommends Microsoft® Windows® XP

Each desktop system comes standard with keyboard, wheel mouse and speakers. Keyboard varies by model. Monitor sold separately. Actual product may vary from photo. New members only. To avoid paying monthly membership fees, cancel during the 6-month promotional period. Telephone access charges and air surcharges may apply. [2] 90 day complimentary AntiVirus subscription included. Applicable state taxes are added for residents of CA, UT, TX and OH. eMachines cannot be responsible for errors in typography or photography. eMachines is a registered trademark of eMachines, Inc. Intel and Celeron are trademarks or registered trademarks of Intel Corporation. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Symantec and the Symantec Trademarks are registered trademarks of Symantec Corporation in the United States and other countries. All other company and product names are trademarks and/or registered trademarks of their respective owners. © 2003 eMachines, Inc. All rights reserved.

Take the ViewSonic® screen test!



The Tablet PC V1100. More power. More freedom. More style.

There's a revolution in PC portability that's as important to your freedom and productivity as the cell phone or laptop. The convergence of the PC with high-resolution display technology is realized with power and mobility in the ViewSonic Tablet PC V1100. If your home is often your office and the road is your conference room, the Tablet PC V1100 is the perfect combination of office manager, legal pad, portable desktop, and productivity networking tool. It offers all the functionality of a Windows® Office™ environment in an unobtrusive, ultra-stylish 3.4 pound profile. With a big write-on screen and superior handwriting recognition, the V1100 does much more than a laptop. Take handwritten meeting notes, or sketch big ideas and immediately share them with your team via integrated LAN and Wi-Fi. Any application that runs on a laptop will run on your Tablet PC. Combined with a ViewSonic projector like the new 2.2 pound PJ250 micro-portable, you've got an incredibly powerful mobile presentation solution under six pounds. Take a screen test today at your ViewSonic reseller or visit **ViewSonic.com** and see why the Tablet PC V1100 is a runaway hit.

Add our compact projector for mobile presentations, or with keyboard included and optional dock, the V1100 easily switches from portable to desktop duty

ViewSonic®
See the difference.

Specifications and pricing subject to change without notice. All logos, trademarks and registrations are the sole properties of the their respective companies and are used by permission.
Copyright © 2003 ViewSonic Corporation. All rights reserved. [V1042-008-EO1D]